

**Agenda Item:** 2.2  
**Source:** ETSI MCC  
**Title:** Report of 3GPP TSG RAN WG2 meeting #93bis,  
Dubrovnik, Croatia, 11th – 15th April 2016  
**Document for:** Approval

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## **Report of 3GPP TSG RAN WG2 meeting #93bis**

**held in Dubrovnik, Croatia**  
**April 11 - 15, 2016**



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## Organisation of the meeting

Meeting: 3GPP TSG RAN WG2 #93bis  
 Meeting location: Dubrovnik, Croatia  
 Duration: Monday 11.04.2016 - Friday 15.04.2016  
 Host: European Friends of 3GPP (EF3)  
 TSG RAN WG2 Chairman: Richard Burbidge (Intel Corporation) email: richard.c.burbidge@intel.com  
 TSG RAN WG2 Vice chairman: Hu Nan (CMCC) email: hunan@chinamobile.com  
 TSG RAN WG2 Vice chairman: Diana Pani (Interdigital Communications) email: diana.pani@interdigital.com  
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 Technical documents: [ftp://ftp.3gpp.org/tsg\\_ran/WG2\\_RL2/TSGR2\\_93bis/Docs](ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_93bis/Docs)  
 Ad hocs: Official parallel ad hocs held (see agenda item 2.1) on  
 LTE Breakout sessions:  
 Topics on Legacy LTE (D2D), feD2D, V2X, V2 chaired by Diana Pani (Interdigital),  
 Topics on VoLTE, Light conn, Mobility enh chaired by Hu Nan (CMCC),  
 Topics on NB-IoT chaired by Johan Johansson (MediaTek)  
 UMTS sessions:  
 Topics on UMTS chaired by Diana Pani (Interdigital);  
 Topic on DTX/DRX enhancements and multi-carrier enhancements  
 chaired by Mark Curran (Ericsson);  
 Topics on RRC optimizations, HS+LTE SI, Indoor positioning and Rel-13 corrections  
 chaired by Xudong Yang (Huawei).  
 next meetings: TSG RAN WG2 #94 23.05. - 27.05.2015 Nanjing, China  
 TSG RAN #72 13.06. - 16.06.2015 Busan, South Korea  
 TSG RAN WG2 #95 22.08. - 26.08.2015 Goteborg, Sweden  
 TSG RAN #73 19.09. - 22.09.2015 TBD, USA

## Statistics/Executive Summary

TSG RAN WG2 #93bis was held in Dubrovnik, Croatia hosted by European Friends of 3GPP. This RAN WG2 meeting had 3 parallel sessions: UMTS session (see AI 10-13; Mon - Thu) and LTE Breakout sessions on (see AI 7.5, 8.2, 8.4, 8.8, 8.10 and 8.11 in [R2-163056](#) (Annex G), AI 8.3, 8.6 and 8.9 in [R2-163057](#) (Annex H), AI 7.14 in [R2-163133](#) (Annex I). All other topics were treated in the parallel main session.

- 188 participants (registered before the meeting: 215 participants).
- 1050 Tdocs allocated with 1002 available contributions.
- 51 incoming liaison statements (2 on UTRA, 49 on LTE; and 0 on joint aspects): 45 of them were treated then noted except 6 LS was not treated due to lack of time and will be resubmitted to RAN2 #94. • 21 of the 51 incoming LSs were received during the RAN2 #93bis meeting.
- 23 outgoing liaison statements (1 on UTRA, 22 on LTE; and 0 on joint aspects), 1 of them agreed by email.
- 30 email discussions scheduled after RAN2 #93bis, see Annex F.
- In this bis meeting only the type draftCRs were treated. A mong 294 draft change requests (draftCRs) in total: 100 draftCRs (11 draftCRs for UTRA 25.xxx specs, 89 draftCRs for LTE 36.xxx specs, 0 draftCR for joint 37.xxx specs) were agreed in principle (13 of 102 are implicitly in principle agreed). They will be (re)submitted to RAN2 #94 for final agreement.
- LTE: Rel-12 and earlier releases (AI 4.1, 6), Rel-13 WIs (AI 7), UTRA REL-11 and earlier releases (AI 10), REL-12 (AI 11) and REL-13 (AI 12):  
Total 102 draftCRs finally were agreed in principle (13 of 102 are implicitly in principle agreed) for corrections on RAN2 specs, see Annex E.
- REL-13 WI: Narrowband IOT (AI 7.16):  
draftCRs to stage 2 and stage 3 specifications are in progress and second NB-IoT Ad-Hoc meeting in May 3 - 4, 2016 planned (hosted by ETSI) for accelating to work before closing the WI in June.
- LTE REL-14 WIs (AI 8):  
Following LTE REL-14 WIs/SIs started to discuss: WI: Enhanced LAA for LTE (AI 8.1), WI: Support for V2V services based on LTE sidelink (AI 8.2), SI: Study on enhancement of VoLTE (AI 8.3), SI: Further

Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables (AI 8.4), WI: Enhanced LTE-WLAN Aggregation (LWA) (AI 8.5), WI: Further mobility enhancements in LTE (WI 8.6), WI: Further Indoor Positioning enhancements for UTRA and LTE (AI 8.7), WI: L2 latency reduction techniques for LTE (AI 8.8), WI: Signalling reduction to enable light connection for LTE (AI 8.9), SI: Study on Latency reduction techniques for LTE (AI 8.10) and SI: Feasibility Study on LTE-based V2X Services (AI 8.11).

- SI: Study on New Radio Access Technology (AI 9):  
Discussions on deployment scenarios, general aspects, NR protocol architecture, LTE/NR - Tight interworking, mobility and dependencies on new CN are in progress.
- UTRA REL-14 WIs (AI 13):  
Following UTRA REL-14 WIs/SIs started to discuss: WI: RRC optimization for UMTS (AI 13.1), WI: DTX/DRX enhancements in CELL\_FACH (AI 13.2), SI: Study on Multi-Carrier Enhancements for UMTS (AI 13.3), WI: Further Indoor Positioning Enhancements for UTRA and LTE (AI 13.4), SI: Study on HSPA and LTE Joint Operation (AI 13.5) and TEI 14 (AI 13.6).

# 1 Opening of the meeting

TSG RAN WG2 chairman Richard Burbidge (Intel Corporation) opened the meeting RAN WG2 #93bis on Monday morning 11.04.2016 at 09:00 o'clock.

On behalf of the host, the European Friends of 3GPP (EF3), Mr. Stanczak, Jędrzej (Nokia Networks) welcomed the delegates to Dubrovnik, Croatia and explained organisational issues.

Following RAN WG2 meeting rooms in the Rixos Libertas Dubrovnik Hotel:

|                                    |                                  |                                        |
|------------------------------------|----------------------------------|----------------------------------------|
| Main RAN2 room:                    | Mistral A (Lobby),               | planned for 220 chairs, Mon-Fri        |
| RAN2 LTE Breakout sessions room:   | Gregale/Zephyros (Ground Floor), | planned for 80 participants, Mon - Thu |
| RAN2 LTE Breakout NB-IoT sessions: | Mistral C (Lobby),               | planned for 80 participants, Mon - Thu |
| RAN2 UMTS session room:            | Levanta (1st floor),             | planned for 30 participants, Mon - Thu |

## 1.1 Call for IPR

Richard Burbidge (TSG RAN WG2 chairman) made the following call for IPRs and reminded the delegates of their obligations with respect to IPRs:

The attention of the delegates of this Working Group is drawn to the fact that **3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective Organizational Partners of Essential IPRs they become aware of**.

The delegates were asked to take note that they were hereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.
- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Statement and the Licensing declaration forms (<http://webapp.etsi.org/Ipr/>).

NOTE: IPRs may be declared to the Director-General or Chairman of the SDO, but not to the RAN WG2 Chairmen.

## 1.2 Network usage conditions

The PCG has laid down the following network usage conditions that were shortly presented by the RAN2 chairman:

**1. Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws.**

**2. Users shall not engage in non-work related activities that consume excessive bandwidth or cause significant degradation of the performance of the network.**

Since the **network is a shared resource**, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting chairman should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair

can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

1. **DON'T place your WiFi device in ad-hoc mode**
2. **DON'T set up a personal hotspot in the meeting room**
3. **DO try 802.11a if your WiFi device supports it**
4. **DON'T manually allocate an IP address**
5. **DON'T be a bandwidth hog by streaming video, playing online games, or downloading huge files**
6. **DON'T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)**

## 1.3 Other

The PCG has laid down the following conditions that were shortly presented by the RAN2 chairman:

In accordance with the Working Procedures it is reaffirmed that:

- (i) compliance with all applicable antitrust and competition laws is required;
- (ii) timely submissions of work items in advance of TSG or WG meetings are important to allow for full and fair consideration of such matters; and
- (iii) the chairman will conduct the meeting with strict impartiality and in the interests of 3GPP

Note on (i): In case of question please contact your legal counsel.

Note on (ii): WIDs don't need to be submitted to the RAN2 meeting and will typically not be discussed here either.

## 2 General

**THANK YOU** to companies that request TDoc numbers and submit contributions early before deadline (really appreciated). Will start to refrain from treating late documents.

### 2.1 Approval of the agenda

[R2-162100](#) Proposed agenda for RAN2 #93bis in Dubrovnik, Croatia, 11.04.-15.04.2016 Intel (RAN2 Chairman) agenda  
=> Approved

| <i>Schedule</i> | <b>Main room<br/>(Mistral A)</b>                                                                                                                                                                  | <b>LTE Breakout room<br/>(Gregale/Zephyros)</b> | <b>UMTS room<br/>(Levanta)</b>                                                    | <b>NB-IoT room<br/>(Mistral C)</b>                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Monday</b>   |                                                                                                                                                                                                   |                                                 |                                                                                   |                                                                                                                                        |
| 09:00 ->        | [1], [2], [3], [4]                                                                                                                                                                                |                                                 |                                                                                   |                                                                                                                                        |
| 11:00 ->        | [5.1], [5.2] [5.3]<br>NB-IOT (email disc #24,<br>ASN.1 structure<br>including email disc #40)<br>Legacy LTE ( <i>starting<br/>with eMTC corrections to<br/>minimise overlap with<br/>NB-IOT</i> ) |                                                 | [8][9] UMTS Rel-<br>8/9/10/11/12                                                  |                                                                                                                                        |
| 14:30 ->        | Legacy LTE                                                                                                                                                                                        | Legacy LTE (D2D) [1]                            | [11.2] DTX/DRX<br>enhancements<br>[11.3] Multi-carrier<br>[10] Rel-13 corrections | [7.14.1] CIOT<br>dependencies<br>[7.14.2.1] MSG3, CIOT,<br>AS/NAS interact,<br>suspend/resume<br>(suspend/resume start after<br>1700). |
| 17:00 ->        |                                                                                                                                                                                                   | feD2D [1]                                       |                                                                                   |                                                                                                                                        |
| <b>Tuesday</b>  |                                                                                                                                                                                                   |                                                 |                                                                                   |                                                                                                                                        |

|                         |                                                                                                             |                                 |                                                                             |                                                                        |
|-------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------|
| 08:30 ->                | Legacy LTE                                                                                                  | feD2D [0.5]<br>V2V [1.5]        | [11.4] Indoor positioning<br>[11.3] Multi-carrier (cont)<br>[11.5] HS + LTE | [7.14.3] UP                                                            |
| 11:00 ->                |                                                                                                             |                                 |                                                                             |                                                                        |
| 14:30 ->                | eLAA [2]                                                                                                    | V2X [2]                         | [11.1] RRC optimizations                                                    | [7.14.2.1] cont. RRC<br>(suspend/resume).<br>[7.14.3] UP (see note 1). |
| 17:00 ->                | TEI13 (CIOT, see note 1)                                                                                    |                                 |                                                                             |                                                                        |
| Wednesday               |                                                                                                             |                                 |                                                                             |                                                                        |
| 08:30 ->                | eLWA [1.5]<br>IP [0.25]                                                                                     | VoLTE [1.5]<br>Light conn [0.5] | [11.6] TEI14<br>[comebacks]                                                 | [7.14.2.2] SI<br>[7.14.2.3] Idle mode<br>[7.14.2.4] Paging             |
| 11:00 ->                | TEI13 (cont)                                                                                                |                                 |                                                                             |                                                                        |
| 14:30 ->                | New RAT [2]                                                                                                 | Mobility enh [1]                |                                                                             | [7.14.2.1] RRC details,<br>Running CR review.                          |
| 17:00 ->                |                                                                                                             |                                 |                                                                             | [7.14.1] Remaining things                                              |
| Thursday                |                                                                                                             |                                 |                                                                             |                                                                        |
| 08:30 ->                | New RAT [4]                                                                                                 |                                 | Comebacks if needed                                                         | NB-IOT Comebacks                                                       |
| 11:00 ->                |                                                                                                             |                                 |                                                                             |                                                                        |
| 14:30 ->                |                                                                                                             |                                 |                                                                             |                                                                        |
| 17:00 ->                |                                                                                                             | Latency red [1]                 |                                                                             |                                                                        |
| Friday                  |                                                                                                             |                                 |                                                                             |                                                                        |
| 08:30 -><br>until 17:00 | Left-overs, Comebacks<br>including Joint<br>LTE/UMTS<br>(No New RAT<br>comebacks on Friday this<br>meeting) |                                 |                                                                             |                                                                        |

#### Chairing of LTE Sessions:

Legacy LTE (D2D), feD2D, V2X, V2V, Latency red will be chaired by Vice Chair Diana Pani (Interdigital)

VoLTE, Light conn, Mobility enh will be chaired by Vice Chair Nan Hu (CMCC)

NB-IOT will be chaired by Johan Johansson (MediaTek)

#### Chairing of UTMS Sessions:

Diana Pani (Interdigital): Legacy UMTS

Mark Curran (Ericsson): DTX/DRX enhancements and multi-carrier enhancements

Xudong Yang (Huawei): RRC optimizations, HS+LTE SI, Indoor positioning and Rel-13 corrections

#### Breaks

Morning coffee: 10:30 to 11:00

Lunch: 13:00 to 14:30

Afternoon coffee: 16:30 to 17:00

## 2.2 Approval of the report of the previous meeting

[R2-162101](#) Draft Report for RAN2 #93 in St.Julian's, Malta, 15.02.-19.02.2016 ETSI MCC report late  
=> Comeback to approve on Friday  
=> Approved in [R2-162150](#)

## 2.3 Reporting from other meetings

### RAN-71

#### CRs:

- 1/ All RAN2 CRs were agreed with the exception of **RP-160520** on the UE capabilities for EB/FD-MIMO (from email discussion 93#46) which was postponed. We need to continue conclude this CR during the next quarter.
- 2/ All the open Rel-13 WIs on which RAN2 was working (MTC, LTE/WLAN and LTW/WLAN for legacy APs) are now closed.

#### NB-IoT:

- 1/ RAN2 will have an NB-IoT ad-hoc on 3 and 4 May 2016 in Sophia Antipolis, France (in the ETSI amphitheatre).

Note that the planned finish time for the second day will be 21:00 to give 2 full meeting days, so please book travel home for the following day. In addition, I would like to stress that, despite the scheduling of this ad hoc, the objective of the April RAN2 meeting should still be to complete the stage 3 CRs without any open issues. The ad-hoc can be used to review the CRs, correct any identified issues, and capture any updates necessary due to work of other groups (e.g. RAN1).

- 2/ On the message 3 and resume ID issue that we escalated to RAN, the way forward was agreed in **RP-160685**.

#### New WIs with RAN2 time

(note that they don't all have RAN2 time during the next quarter):

#### RAN2 led:

- 1 - Study on enhancement of VoLTE (SID: **RP-160563**)
- 2 - Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables (SID: **RP-160677**)

Note that this study item currently only has time allocated for Q2 and the objective during Q2 is "Until RAN#72, evaluate scenarios in RAN2 considering progress in SA WGs, and refine objectives accordingly. "

- 3 - Enhanced LWA (WID: **RP-160600**)
- 4 - Further mobility enhancements in LTE (WID: **RP-160636**)
- 5 - Further Indoor Positioning enhancements for UTRA and LTE (WID: **RP-160538**)
- 6 - L2 latency reduction techniques for LTE (WID: **RP-160667**)
- 7 - Signalling reduction to enable light connection for LTE (WID: **RP-160540**)

#### RAN1 led:

- 1 - Study on New Radio Access Technology (SID: **RP-160671**)
- 2 - Downlink Multiuser Superposition Transmission for LTE (WID: **RP-160680**)
- 3 - Enhancements on Full-Dimension (FD) MIMO for LTE (WID: **RP-160623**)
- 4 - eMBMS enhancements for LTE (WID: **RP-160675**)
- 5 - SRS Carrier Based Switching for LTE WID: (**RP-160676**)

#### RAN3 led:

- 1 - Study on Context Aware Service Delivery in RAN for LTE (SID: **RP-160633**)
- 2 - Study on HSPA and LTE Joint Operation (SID: **RP-160571**)

#### RAN4 led:

- 1 - Measurement Gap Enhancement for LTE (WID: **RP-160678**)

## 2.4 Others

### Rapporteur changes

| Spec   | former rapporteur                 | proposed new rapporteur    |
|--------|-----------------------------------|----------------------------|
| 36.302 | David Bhatoolaul (Nokia Networks) | Chunli Wu (Nokia Networks) |
|        | => Approved                       |                            |

### Isolated impact analysis

Note that an isolated impact analysis is required for Rel-8 to Rel-13 CRs from Q2 2016 onwards.

Only corrections where there is a proven problem are allowed for frozen releases (Rel-8 to Rel-13).

### RAN2 WG compendium

Latest version can always be found at [ftp://ftp.3gpp.org/tsg\\_ran/WG2\\_RL2/Org/RAN2\\_Compendium/](ftp://ftp.3gpp.org/tsg_ran/WG2_RL2/Org/RAN2_Compendium/)

[R2-162102](#) RAN2 Compendium v31.0 after RAN#71 ETSI MCC other  
late  
Not treated

### Drafting rules

Note that specification drafting rules in TR 21.801 must be followed when drafting a CR and draft TS/TR.

Latest version can always be found at [http://www.3gpp.org/ftp/specs/archive/21\\_series/21.801/](http://www.3gpp.org/ftp/specs/archive/21_series/21.801/)

### Time Budget

The time budget endorsed at RAN-71 is available in [RP-160617](#)

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## 3 Incoming liaisons

*Note: LSs are moved to the respective agenda items if any.*

### 3.1 Joint UMTS/LTE relevance

No contribution received.

### 3.2 LTE relevance

#### TEI13:

[R2-162108](#) LS on ECID positioning for TDD ([R1-161518](#); contact: Intel) RAN1 LS in  
to: RAN2 Rel-13 LCS\_LTE, TEI13

- Intel explained the LS contained a typ in "oeNB Behavior 2: With UE Behavior 1" - should have been "With UE Behavior 2"
- Qualcomm wonders if we can avoid RAN2 impact as the location server does not know the UE release.

=> Noted. Contributions can be brought to address the issues raised by Qualcomm.

[R2-162109](#) LS on RA-RNTI determination for PRACH in TDD ([R1-161524](#); contact: Qualcomm) RAN1 LS  
into: RAN2 Rel-13 TEI13

- Qualcomm have a CR that we will see later
- Samsung ask what this means for earlier releases. Does the eNB need to take care of this in some way?

=> Noted

#### LWA and LWIP:

[R2-162112](#) Proposed liaison response to 3GPP on LWA and LWIP (IEEE 802.11-16/0489r2; contact: Broadcom) IEEE 802.11 LS in to: RAN2 Rel-13

- Apple ask what is the next step from outside. We see a value in this.

=> Noted

#### DL Control Channel IM:

[R2-162114](#) LS on CRS-Assistance signaling for the DL Control Channel IM (R4-161198; contact: Intel)  
RAN4 LS in to: RAN2 Rel-13 LTE\_IM\_DLCCH  
- Intel have a CR that will be seen later under TEI13.  
=> Noted

**NAICS subset capability:**

[R2-162115](#) Reply LS to [R2-154975](#) on NAICS subset capability (R4-161440; contact: Qualcomm) RAN4  
LS in to: RAN2 Rel-12 LTE\_NAICS-Core  
- Already addressed by CRs at last meeting  
=> Noted

**REL-13 UE feature:**

[R2-162125](#) LS on LTE Rel-13 UE feature list ([R1-161547](#); contact: NTT DOCOMO) RAN1 LS in  
to: RAN2 Rel-13  
- Already taken into account during last meeting.  
=> Noted

[R2-162139](#) LS on updated LTE Rel-13 UE feature list ([R1-161567](#); contact: NTT DOCOMO) RAN1 LS in  
to: RAN2 Rel-13  
late  
=> Noted. To be taken into account during NB-IOT session.

**eMBMS enhancements:**

[R2-162141](#) TR for eMBMS enhancements for LTE ([R1-163450](#); contact: Ericsson) RAN1 LS in  
to: RAN2 Rel-14 MBMS\_LTE\_enh2-Core  
NOTE : TR number may be provided by RAN2 in the next week (probably a 36.7xx) since  
RAN1 suggests any further updates of the TR can be done by RAN2 without approval in  
RAN1. With TR number, RAN2 may start again with own version numbering.  
=> Noted

**V2X:**

[R2-162146](#) LS on DL broadcast/multicast for V2X (R1-163862; contact: LGE) RAN1 LS in  
to: RAN2 Rel-14 FS\_LTE\_V2X  
late  
=> Noted

**Handover Optimization for HPUE:**

[R2-162991](#) LS to RAN2 to Review Handover Optimization for HPUE (R4-161767; contact: Sprint) RAN4  
LS in to: RAN2 Rel-14 LTE\_B41\_HPUE  
late  
- Ericsson ask in which release the signalling would be needed.  
- Sprint understand that this affects public safety UEs as well.  
- Qualcomm hint that we can agree to do a TEI13 CR from the study.  
=> Noted  
☒ **[93#18][LTE/HPUE] LS from RAN4 R2-162991 (Sprint)**  
Discuss whether the proposed signalling is beneficial and if so decide on the impact to  
RAN2 specs and potential release of any change. Information to be provided to RAN4 by  
LS from next meeting. Could draft LS depending on progress of email.  
Intended outcome: Report and potential LS to next meeting.  
Deadline: Thursday 05/05/2016

[R2-162992](#) LS on TR update for latency reduction (R1-163922; contact: Ericsson) RAN1 LS in  
to: RAN2 Rel-14 FS\_LTE\_LATRED  
=> Noted

☒ **[93#01][LTE/Latred Study] Update TR (Ericsson)**  
Intended outcome: Updated TR with RAN1 agreements.  
Deadline: Thursday 21/04/2016

[R2-162993](#) LS on UE/band specific support of UL 256QAM ([R1-163915](#); contact: Nokia) RAN1 LS in  
cc: RAN2 Rel-14 LTE\_UL\_CAP\_enh-Core late

[R2-162994](#) LS on V2X synchronization procedure ([R1-163907](#); contact: NTT DOCOMO) RAN1 LS in  
to: RAN2 Rel-14 LTE\_SL\_V2V-Core late

[R2-162995](#) LS on resource allocation for V2V ([R1-163906](#); contact: LGE) RAN1 LS in  
to: RAN2 Rel-14 LTE\_SL\_V2V-Core late

Above late contributions not treated due to lack of time and will be made available to the next meeting

In addition, the following LSiN:

- [R2-162105](#) will be treated under AI 8.2.1
- [R2-162106](#), [R2-162107](#), [R2-162148](#) will be treated under AI 7.10
- [R2-162110](#) will be treated under AI 7.1
- [R2-162111](#), [R2-162117](#), [R2-162118](#), [R2-162119](#), [R2-162120](#), [R2-162122](#), [R2-162124](#), [R2-162126](#), [R2-162128](#), [R2-162103](#), [R2-162104](#), [R2-162121](#), [R2-162149](#) will be treated under AI 7.14.1
- [R2-162113](#) will be treated under AI 7.13
- [R2-162116](#) will be treated under AI 8.11
- [R2-162123](#), [R2-162140](#) will be treated under AI 7.2
- [R2-162127](#) will be treated under AI 7.9
- [R2-162132](#), [R2-162133](#), [R2-162142](#), [R2-162143](#), [R2-162144](#), [R2-162145](#), [R2-162147](#) will be treated under AI 7.4
- [R2-162116](#) will be treated under 8.11

### 3.3 UMTS relevance

The following LSiN:

- [R2-162129](#) will be treated under AI 13.3
- [R2-162130](#) will be treated under AI 13.2

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## 4 Joint UMTS/LTE: Rel-13 and earlier releases

Contributions submitted under this agenda item will be handled in a joint UMTS/LTE session.

### 4.1 Joint UMTS/LTE: Rel-12 and earlier releases

(SIMTC-RAN\_OC-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Sep. 12, WID: [RP-111373](#))

(eMDT\_UMTSLTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec.12, WID: [RP-121204](#))

(SONenh2\_LTE\_UTRA-Core, leading WG: RAN3, REL-11, started: Sep.11, closed: Dec.12, WID: [RP-120314](#))

(rSRVCC-GERAN, leading WG: GERAN2, REL-11, started: Sep.11, closed: Nov.13, WID: GP-111290)

(EHNb\_enh3-Core, leading WG: RAN3, REL-12, started: Sep.12, closed: Dec 13, WID: [RP-130741](#))

(MTCe\_RAN-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: [RP-132053](#))

(UTRA\_LTE\_WLAN\_interw-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Sep.14, WID: [RP-132101](#))

(LTE\_UTRA\_IncMon-Core, leading: RAN4, REL-12, started: Dec.13, closed: Dec. 14, WID: [RP-132061](#))

Including corrections to joint LTE+UMTS TEI functionality in Rel-8 to 12. E.g. “Multiple Frequency Bands per Cell”, ...

[R2-162665](#) Clarification for UE behaviour upon reception of requested E-UTRA frequency band list  
Nokia, Alcatel-Lucent Shanghai Bell draftCR 25.331 13.2.0- - F Rel-13  
HSUPA\_DB\_MC-Core

Moved from 10 to 4.1

- Ericsson thinks the change may be backward incompatible as the network can not know if the UE is an older UE that reports all capabilities.
- => Compatibility should be updated on cover sheet
- => Revision in [R2-163059](#)

[R2-163059](#) Clarification for UE behaviour upon reception of requested E-UTRA frequency band list  
Nokia, Alcatel-Lucent Shanghai Bell draftCR 25.331 10.19.0 - - F Rel-10  
TEI10 [R2-162665](#)  
=> Clean up to remove the comments.

=> Agreed in principle in R2-163138

## 4.2 Joint UMTS/LTE: Rel-13 WIs

Including correction related to the following WIs:

(ACDC-RAN-Core; leading WG: RAN2; REL-13; started: Mar. 15; closed: Dec. 15; [RP-150662](#))

No contribution received.

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## 5 Joint UMTS/LTE: Rel-14

UTRA\_LTE\_iPos\_enh2-Core will be treated under separate UMTS and LTE agenda items in 8.7 and 13.4 respectively.

FS\_UTRA\_LTE\_JOP will be treated under a UMTS agenda item in 13.5 only.

### 5.1 Other Joint UMTS/LTE Rel-14 WIs

No contribution received.

### 5.2 Joint UMTS/LTE TEI14 enhancements

Small Technical Enhancements affecting both LTE and UMTS Rel-14 that do not belong to any Rel-14 WI.

Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

No time allocation for Joint UMTS/LTE TEI14 at this meeting.

No contribution received.

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## 6 LTE: Rel-12 and earlier releases

(LTE-L23, leading WG: RAN2, REL-8, started: Sep. 06, closed: Dec. 08, WID: [RP-080747](#))

(LTE\_CA-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: [RP-100661](#))

(LTE\_UL\_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: June 11, WID: [RP-100959](#))

(LTE\_eDL\_MIMO-Core, leading WG: RAN1, REL-10, started: Dec.09, closed: March 11, WID: [RP-100196](#))

(LTE\_Relay-Core, leading WG: RAN1, REL-10, started: Dec. 09, closed: June 11, WID: [RP-110911](#))

(MBMS\_LTE\_enh-Core, leading WG: RAN2, REL-10, started: June 10, closed: March 11, WID: [RP-101244](#))

(MDT\_UMTSLTE-Core, leading WG: RAN2, REL-10, started: Dec. 09, closed: June 11, WID: [RP-100360](#))

(eICIC\_LTE-Core, leading WG: RAN1, REL-10, started: March 10, closed: June 11, WID: [RP-100383](#))

(SONenh\_LTE-Core, leading WG: RAN3, REL-10, started: March 10, closed: June 11, WID: [RP-101004](#))

(LTE\_CA\_enh-Core, leading WG: RAN1, REL-11, started: March 11, closed: Mar.13, WID: [RP-121999](#))

(MBMS\_LTE\_SC-Core, leading WG: RAN2, REL-11, started: June 10, closed: Sep.12, WID: [RP-120258](#))

(LTE\_eDDA-Core, leading WG: RAN2, REL-11, started: March 11, closed: Dec.12, WID: [RP-120256](#))

(LCS\_LTE-NBPS-Core, leading WG: RAN2, REL-11, started: March 09, closed: June. 13, WID: [RP-131259](#))

(eICIC\_enh\_LTE-Core, leading WG: RAN1, REL-11, started: March 11, closed: Dec. 12, WID: [RP-120860](#))

(SPIA\_IDC\_LTE-Core, leading WG: RAN2, REL-11, started: Sep.11, closed: Dec. 12, WID: [RP-111355](#))

(COMP\_LTE\_DL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: [RP-111365](#))  
(COMP\_LTE\_UL-Core, leading WG: RAN1, REL-11, started: Sep.11, closed: Dec.12, WID: [RP-111365](#))  
(LTE\_TDD\_add\_subframe, leading WG: RAN1, REL-11, started: March 12; closed: Sep. 12, WID: [RP-120384](#))  
(FS\_HetNet\_eMOB\_LTE, leading WG: RAN2, REL-11, started: March 11, closed: Sep. 12, WID: [RP-110709](#))  
(LTE\_enh\_dl\_ctrl-Core, leading WG: RAN1, REL-11, started: Dec. 11, closed: Dec. 12, WID: [RP-120871](#))  
(LTE\_SC\_enh\_dualC-Core, leading WG: RAN2, REL-12, started: Dec.13, closed: Dec.14, WID: [RP-141797](#))  
(LTE\_SC\_enh\_L1-Core, leading WG: RAN1, REL-12, started: Dec.13, closed: Dec.14, WID: [RP-132073](#))  
(LTE\_D2D\_Prox-Core, leading WG: RAN1, REL-12, started: Mar.14, closed: Mar.15, WID: [RP-142043](#))  
(MBMS\_LTE\_OS-Core, leading WG: RAN2, REL-12, started: Sep.13, closed: Dec.14, WID: [RP-140282](#))  
(LTE\_NAICS-Core, leading WG: RAN1, Rel-12, started: Mar 14, closed: Dec.14, WID: [RP-140519](#))  
(LC\_MTC\_LTE-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Dec 14, WID: [RP-140522](#))  
(GCSE\_LTE-MBMS\_CM-Core, leading WG: RAN3, started: Sep. 14, closed: Mar. 2015, WID: [RP-141035](#))  
(LTE\_CA\_TDD\_FDD-Core, leading WG: RAN1, REL-12, started: Jun 13, closed: Jun 14, WID: [RP-140465](#))  
(LCS\_BDS-LTE-Core, leading WG: RAN2, REL-12, started: Mar 13, closed: Dec 13, WID: [RP-130416](#))  
(LTE\_eDL\_MIMO\_enh-Core, leading WG: RAN1, REL-12, started: Sep 12, closed: June 14, WID: [RP-121416](#))  
(HetNet\_eMOB\_LTE-Core, leading WG: RAN2, REL-12, started: Dec.12, , closed: Sep 14, WID: [RP-122007](#))  
(Cov\_Enh\_LTE-Core, leading WG: RAN1, REL-12, started: Jun.13, closed: Jun.14, WID: [RP-130833](#))  
(LTE\_TDD\_eIMTA-Core, leading WG: RAN1, REL-12, started: Dec 12, closed: Jun.14, WID: [RP-121772](#))  
(SCM\_LTE-Core, leading WG: RAN2, REL-12, started: Mar.14, closed: Sep.14, WID: [RP-140434](#))

[R2-162175](#) Clarification on uplink transmission timing difference for CA HTC Corporation draftCR  
36.321 13.1.0- - F Rel-11 LTE\_CA\_enh-Core  
- Ericsson ask what has changed in Rrelease 12  
=> Not pursued.

[R2-162176](#) Clarification on uplink transmission timing difference for CA and DC HTC Corporation  
draftCR 36.321 13.1.0- - F Rel-12 LTE\_CA\_enh-Core, LTE\_SC\_enh\_dualC-  
Core  
Not treated

[R2-162304](#) Clarification regarding IDC indication Samsung Telecommunications discussion

- Samsung think that the message content may be the same but the measurement objects may have changed. So it makes sense to send the IDC indication again. With different measurement objects the eNB action may be different. If nothing is sent then the eNB will think the UE doesn't have IDC problem. BlackBerry think there is a separate trigger when the configuration has changed. Qualcomm think that refers to the IDC configuration but not the CA configuration.
- DOCOMO agree that for GPS there is no frequency information included, but the root cause may be different depending on the UL band combination. It makes sense to report for the current band combination.
- Samsung understand that whenever the situation changes then we send an indication to the network. Qualcomm agree there is a way that the UE could inform the eNB that the issue is resolved.

=> Offline discussion (Samsung)  
- Samsung explain that after the offline companies are ready to agree a CR  
=> Noted

[R2-163132](#) Clarification regarding IDC indication upon change of UL CA affecting GNSS Samsung  
draftCR 36.331 11.15.0

=> Agreed in principle

- [R2-162667](#) Change of DRB ID in Full Configuration NTT DOCOMO INC. discussion
- Nokia think that if there is no handover then security keys don't change and so there is an issue if DRB id is used. Samsung explain that full config is only used in cases where security is refreshed.
  - Samsung think that in the full config case we have a RACH and hence there is a synchronisation point and hence no issue. So assume that DOCOMO is correct.
  - Nokia think there is no clear requirement that there is a DRB release.
- => Offline discussion (DOCOMO)
- DOCOMO describe that proposal 1 and 2 from the document could be agreed.
- => Noted

- [R2-163024](#) drb-identity change in full configuration NTT DOCOMO, INC. draftCR 36.331 12.9.0- - F Rel-12 LTE-L23, TEI12
- => RAN2 understand that this is a clarification of the current behaviour.
- => Agreed in principle

- [R2-162696](#) Corrections on the data modulation of Downlink-Shared Channel NTT DOCOMO INC. draftCR 36.302 12.6.0- - F Rel-12 LTE\_SC\_enh\_L1-Core
- => Agreed in principle

- [R2-162309](#) Corrections on the data modulation of Downlink-Shared Channel NTT DOCOMO INC. draftCR 36.302 13.1.0- - A Rel-13 LTE\_SC\_enh\_L1-Core
- => Agreed in principle

- [R2-162738](#) Correction of IE name "systemInformationBlockType1Dedicated" Kyocera draftCR 36.331 11.15.0 - - F Rel-11 eICIC\_enh\_LTE-Core
- Ericsson ask if this is really need for R11. Nokia agree.
- => Not pursued

- [R2-162739](#) Correction of IE name "systemInformationBlockType1Dedicated" Kyocera draftCR 36.331 12.9.0- - A Rel-12 eICIC\_enh\_LTE-Core
- => Not pursued

- [R2-162740](#) Correction of IE name "systemInformationBlockType1Dedicated" Kyocera draftCR 36.331 13.1.0- - A Rel-13 eICIC\_enh\_LTE-Core
- => Revised to be Cat F CR. Agreed in principle in [R2-163079](#)

- [R2-162928](#) TA timer behaviour QUALCOMM discussion
- Ericsson think this is an optimisation for TA accuracy but think that it doesn't necessarily improve the accuracy. Qualcomm think that in the handover case TA is only measured on a single transmission.
  - LG think this is a poor eNB implementation . It should not send TA MAC CE before the handover is successful. Ericsson think eNB should not send TA command unless it has received uplink transmissions. Nokia think it is a strange UE implementation. Huawei agree with LG
  - ZTE wonders why the UE is still monitoring the C-RNTI after the contention resolution has failed
  - Intel wonder how often this can happen.
- => Noted

- [R2-162929](#) TA timer behaviour QUALCOMM draftCR 36.321 12.9.0- - F Rel-12 TEI12
- Not treated

- [R2-162446](#) RLM for PSCell in dual connectivity Intel Corporation
- Huawei understand that if network doesn't configure the timers and constants then the UE will not trigger the RLF for that cell. Ericsson agree and think the physical layer continues its monitoring but it is ignored by the higher layers.
  - Ericsson think nothing needs to be changed for RAN1 spec. Intel think we need to inform this to RAN1/4.
  - Samsung ask if there is a used case or is it just that the signalling allows it.
  - ZTE think it is not clear that when the timers/constants are not provided then RLM is disabled.

- Nokia think the original agreement in R12 is that RLM is always used on the PSCell and the RRC spec may not be in line.
  - Ericsson think we can't force the eNB to configure this for backward compatibility reasons. Huawei have the same view.
  - => RAN2 understanding - if eNB does not configure the timers/constants for RLM then UE can not run RLM and the consequence is that RLF due to physical layer failure will never be triggered for the PSCell.
  - Intel think we should tell RAN1/4 about the status of the RAN2 specification. Huawei think it doesn't matter to RAN1/4. Intel thinks it matter to UE implementation.
  - => Noted
  - => Discuss offline whether to send LS (Intel)
- [R2-162988](#) [DRAFT] LS on RLM for PSCell in dual connectivity Intel Corporation LS out  
Rel-12 LTE\_SC\_enh\_dualC-Core  
=> Remove " UE cannot run RLM and "  
=> With change above the LS is approved in [R2-163137](#)

#### Capability related

- [R2-162424](#) Clarification on the presence of ul-64QAM-r12 for DL-only bands Huawei, HiSilicon draftCR 36.331 12.9.0- - F Rel-12 TEI12
- Intel agrees with the intent but wonders what the IOT problems referred to in the coversheet are. Ericsson shares the same question. Huawei thinks a network might check this field for a DL only band. Want to know how the eNB checks that UE sets this for all bands.
  - Nokia has some sympathy for the CR.
- => Coverage to be cleaned up  
=> Revision in [R2-163080](#)
- [R2-163080](#) Clarification on the presence of ul-64QAM-r12 for DL-only bands Huawei, HiSilicon draftCR 36.331 12.9.0- - F Rel-12 TEI12 [R2-162424](#)  
=> Agreed in principle
- [R2-162425](#) Clarification on the presence of ul-64QAM-r12 for DL-only bands Huawei, HiSilicon draftCR 36.331 13.1.0- - A Rel-13 TEI12  
Not treated
- [R2-162438](#) Clarification on MIMO capability Huawei, HiSilicon discussion
- Intel understand that the UE can report different MIMO capability for the same combination, but understand that RAN1 see no ambiguity in their specification.
  - Qualcomm think we sent an LS to RAN1 on this in the past. Huawei explain that we did send an LS but RAN1 only made a change for R11 and for the interband case it doesn't apply.
  - DOCOMO think the network will configure the number of layer in line with the capability and the UE should be able to handle it.
  - Intel think that the Kc and RI bit width is based on the max number of MIMO layers for the band and not for the band combination.
- => To be discussed offline (Huawei)  
- Huawei gave an update of the offline. Companies want to have more time to check  
=> Postponed to next meeting
- [R2-162442](#) Clarification on MIMO capability Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-10 TEI10
- [R2-162441](#) Clarification on MIMO capability Huawei, HiSilicon draftCR 36.331 13.1.0- - A Rel-11 TEI10
- [R2-162440](#) Clarification on MIMO capability Huawei, HiSilicon draftCR 36.331 13.1.0- - A Rel-12 TEI10
- [R2-162439](#) Clarification on MIMO capability Huawei, HiSilicon draftCR 36.331 13.1.0- - A Rel-13 TEI10  
Above 4 Tdocs not treated
- [R2-162809](#) Split of DL and UL category 4 Sequans Communications draftCR 36.306 12.8.0- - F Rel-12 LTE-L23, TEI12

- Samsung think we have this well defined Cat 4 in the field. Only way to do this would be to add a new Cat with same parameters. Sequans would see this as a new category combination.
- Intel think that new categories should be based on clear demand from the market but we don't see other supporting companies. Sequans see a need from the market.
- ZTE support the CR
- Ericsson think this should come from RAN1.
- Huawei would like time to check whether there is market requirement.
- DOCOMO don't see such a strong need for this category. Also wonders what happens if the UE supports this but the legacy eNB doesn't. Huawei think UE will have to indicate the legacy Cat 4 as well.
- Nokia think that these kind of things should go via RAN plenary.

=> Technical aspects of the CR can be discussed offline.

=> Coversheet can be updated to include backward compatibility aspects

=> Revision in [R2-163081](#)

[R2-163081](#) Split of DL and UL category 4 Sequans Communications draftCR 36.306 12.8.0- - F  
Rel-12 LTE-L23, TEI12 [R2-162809](#)

- Samsung think this is a RAN decision. Qualcomm, Nokia share this view.

=> Technically endorsed and will be sent to RAN for final decision.

[R2-162808](#) Split of DL and UL category 4 Sequans Communications draftCR 36.331 12.9.0- - F  
Rel-12 LTE-L23, TEI12

=> Revision in [R2-163082](#)

[R2-163082](#) Split of DL and UL category 4 Sequans Communications draftCR 36.331 12.9.0- - F  
Rel-12 LTE-L23, TEI12 [R2-162808](#)

=> Technically endorsed and will be sent to RAN for final decision.

[R2-162868](#) Clarification on maximum number of DL-SCH transport block bits for DL Category 15 and 16  
NTT DOCOMO, INC., Samsung, Nokia, Alcatel-Lucent Shanghai Bell, Fujitsu, NEC draftCR  
36.306 12.8.0- - F Rel-12 LTE\_CA-Core, TEI12, LTE\_SC\_enh\_L1-Core

- DOCOMO agree that the issue also exists for other categories. But want to clarify for Cat 15/16 as max TBS is defined as a range. Concerned that if the capability is exceeded then the UE might disable some feature to fit inside the range but then the UE won't support the maximum value of the range, and in this case the eNB will not know what the UE supports.
- Intel think the CR is ok. Understand that the TBS determines the baseband capability but in Cat 15/16 case it is not so clear due to the range.

=> Agreed in principle.

[R2-162870](#) Clarification on maximum number of DL-SCH transport block bits for DL Category 15 and 16  
NTT DOCOMO, INC., Samsung, Nokia, Alcatel-Lucent Shanghai Bell, Fujitsu, NEC draftCR  
36.306 13.1.0- - A Rel-13 LTE\_CA-Core, TEI12, LTE\_SC\_enh\_L1-Core  
Not treated

#### Sidelink related

[R2-162250](#) Addition of S-RSRP abbreviation definition CATT draftCR 36.300 13.3.0- - F Rel-  
13 LTE\_eD2D\_Prox-Core  
*moved from 4.1*

- Clarified that the R13 spec already included this

=> Coversheet to be changed to use R12 work item code

=> Agreed in principle in [R2-163093](#)

[R2-162252](#) Discussion on conditions for sidelink discovery Huawei, HiSilicon discussion

- Ericsson think this was discussed for R13 and the conclusion was to split this text into several cases. Should we do the same in R13. Huawei think it is not necessary in R12 as R12 is simpler.

=> Noted

[R2-162253](#) Corrections on conditions for sidelink discovery operation Huawei, HiSilicon draftCR  
36.304 12.7.0- - F Rel-12 LTE\_D2D\_Prox-Core

- Huawei suggest adding a note saying the in idle mode reception of sidelink discovery is up to UE implementation.

- => Add note as described by Huawei above. Wording can be worked offline (e.g. same as R13)
- => Coversheet to be improved
- => Revision in [R2-163094](#)

[R2-163094](#) Corrections on conditions for sidelink discovery operation Huawei, HiSilicon draftCR  
36.304 12.7.0- - F Rel-12 LTE\_D2D\_Prox-Core [R2-162253](#)  
=> Agreed in principle

[R2-162254](#) Corrections for SL resource configuration during handover Huawei, HiSilicon draftCR  
36.331 12.9.0- - F Rel-12 LTE\_D2D\_Prox-Core  
- Qualcomm think this was discovered and captured generically in R12. UE should use the resources and timing from the same cell. Intel agree that these resources from the target cell. Panasonic agree. Ericsson agree.  
- Ericsson think it is clear that at handover the UE receives resources from the target. Nokia think the 'received in' does cause confusion.  
- Huawei explain this is already covered in R13.  
=> Change "received in" to "configured for". Proposes change not included.  
=> Agreed in principle in [R2-163095](#)

[R2-162260](#) Corrections for sidelink in TS 36.331 Huawei, HiSilicon draftCR 36.331 12.9.0- - F  
Rel-12 LTE\_D2D\_Prox-Core  
- Ericsson think that for R12 the text in 5.10.5 is correct as we agreed the UE does discovery without impacting normal operation. Qualcomm agree this is not needed to be changed.  
- Qualcomm think in several places in R12 it was clear that UE prioritises normal operation. But in R13 we added the gap concept and that meant we had to change things but R12 is clear.  
=> Only the definition is kept.  
=> Modify the title to be more descriptive of the change.  
=> Agreed in principle in [R2-163096](#)

[R2-162255](#) Corrections for sidelink in TS 36.331 Huawei, HiSilicon draftCR 36.331 13.1.0- - A  
Rel-13 LTE\_D2D\_Prox-Core  
=> Not pursued

[R2-162256](#) Corrections on RoHC description Huawei, HiSilicon draftCR 36.323 12.5.0- - F  
Rel-12 LTE\_D2D\_Prox-Core  
- Ericsson wonder if this is really necessary. What is the error.  
=> First change is not included  
=> Add an interoperability statement for interop between 2 UEs.  
=> Agreed in principle in [R2-163097](#)

[R2-162257](#) Corrections on RoHC description Huawei, HiSilicon draftCR 36.323 13.1.0- - A  
Rel-13 LTE\_D2D\_Prox-Core  
Not treated

[R2-162258](#) Corrections for sidelink description Huawei, HiSilicon draftCR 36.322 12.3.0- - F  
Rel-12 LTE\_D2D\_Prox-Core  
=> Remove the note under the figure.  
=> Add an interoperability statement for interop between 2 UEs.  
=> Agreed in principle in [R2-163098](#)

[R2-162259](#) Corrections for sidelink description Huawei, HiSilicon draftCR 36.322 13.1.0- - A  
Rel-13 LTE\_D2D\_Prox-Core  
Not treated

## 7 LTE: Rel-13

### 7.1 WI: Licensed-Assisted Access using LTE

(LTE\_LAA-Core, leading WG: RAN1, REL-13; started: June 15, closed: Dec. 15, WID: [RP-151045](#))

#### Incoming LS:

[R2-162110](#) LS on Channel Bandwidths for LAA ([R1-161540](#); contact: Ericsson) RAN1 LS in to: RAN2 Rel-13 LTE\_LAA-Core  
*moved from 3.2*

- BlackBerry ask if there are any other bandwidths that can't be used. Ericsson assume that it is only 20 that can be used but will double check.
  - BlackBerry suggest this should be captured in stage 2.
  - Huawei is not sure whether we need to capture this in the core specifications.
- => Noted

[R2-162975](#) Capturing restrictions on LAA bandwidth in stage 2 BlackBerry UK Limited draftCR 36.300 13.3.0- - F Rel-13 LTE\_LAA-Core related with [R2-162110](#)  
late

- Huawei think band and bandwidth limitations do not need to be captured in our stage 2.
  - BlackBerry agree we don't normally capture bands, and normally bandwidths as LTE supports all bandwidths but this seems to be an exception.
  - Ericsson think we can rely on RAN4.
- => Not pursued. We assume that RAN4 will capture this.

[R2-162301](#) IDC issue for LAA Samsung, BlackBerry, Intel, Sony discussion

- Huawei think the compromise from the email discussion was ok.
- Qualcomm think that the only option for the UE is to discontinue LAA operation.
- Ericsson think we can stick to the conclusion of the SI.
- Samsung also asks whether the UE should perform re-establishment if it is given a configuration for LAA that it can't comply with.
- Qualcomm think that detach/reattach is overkill.
- Huawei ask if sharing the WLAN RF is a common case or not. BlackBerry think it is necessary to share at least some RF components. Intel share this understanding that RF will be common and it is almost not possible to support concurrent operation.
- Intel think the correct way to address this is via IDC and we should not promote other UE implementation options.
- Intel understand that it is difficult to agree more in the spec but share the view of Samsung that the current text doesn't make it very clear that it is related to hardware conflict. Would like to consider further improvement for R14.

=> RAN2 understanding that the UE does not trigger re-establishment when given a LAA configuration that the UE can't use due hardware conflict for LAA and WLAN operations. UE can use the IDC mechanism, if configured, to indicate the problem to the eNB. If IDC is not configured then the only standardised approach is to perform detach/re-attach.

[R2-162952](#) Clarification on selection of the channel access priority class Beijing Xinwei Telecom Techn. draftCR 36.300 13.3.0- - F Rel-13 LTE\_LAA-Core  
for replacing withdrawn CR in [R2-162414](#)

- Huawei think that multiplexing requirements are covered in 5.7.2 and it is sufficient. Ericsson agree it is covered in that section. Xinwei think this is addressing a different case. MediaTek agree with Huawei and Ericsson. BlackBerry, Nokia share this view.

=> Not pursued.

[R2-162801](#) Transfer of REL-13 parameters in inter node signalling Samsung Telecommunications discussion  
late  
=> Withdrawn

#### Withdrawn:

[R2-162414](#) Clarification on selection of the channel access priority class Beijing Xinwei Telecom Techn. CR 36.300 13.3.00865 - F Rel-13 LTE\_LAA-Core

## 7.2 WI: CA enhancements

(LTE\_CA\_enh\_b5C-Core, leading WG: RAN1, REL-13; started: Dec. 14, closed: Dec. 15, WID: [RP-151984](#))

Including output of email discussion [93#37][LTE/eCA] Capability backward compatibility (Huawei)

### Incoming LS:

[R2-162123](#) Reply LS to [R2-156977](#) on extension to field length of PDCP Sequence Number (C4-161500; contact: Nokia Networks) CT4 LS in  
to: RAN2 Rel-13 LTE\_CA\_enh\_b5C-Core  
*moved from 3.2*  
=> Noted

[R2-162140](#) Response LS on extension to field length of PDCP Sequence Number RAN3 LS in  
late  
- ZTE has concerns about the response to Q2. Think it is not clear that the target will discard the PDU. Nokia thinks that stage 2 specifies that in case of full configuration all the PDCP PDUs are discarded. But agree with is more RAN3 scope.  
- Nokia think there is not much we can add to the response.  
=> Noted  
=> We will not send a separate LS to respond to CT4's questions.

### PDCP SN (related to LS)

[R2-162670](#) Extension to field length of PDCP Sequence Number Nokia, Alcatel-Lucent Shanghai Bell  
discussion  
=> Not treated. Covered by discussion of [R2-162140](#)

[R2-162671](#) [DRAFT] Reply LS on extension to field length of PDCP Sequence Number Nokia, Alcatel-Lucent Shanghai Bell LS out  
=> Not treated. Covered by discussion of [R2-162140](#)

### Email discussion [93#37][LTE/eCA] Capability backward compatibility (Huawei)

[R2-162279](#) eCA Capability backward compatibility Huawei discussion  
- DOCOMO only 5 companies contributed and on point 4 3 compnaies thought that eNB could derive the capabilities in the old format. ZTE think we shall not mandate the eNB to derive the old format and the source may be able to know that the target can understand the new format. Qualcomm think the X2 case is easy and the source may not the capability of the target but this is not so easy if the capabilities come from the MME.  
- Huawei explain that in last meeting Hauwei and DOCOMO provided a CR for how to derive the capabilities but this wasn't submitted again.  
- Samsung also think that we can leave this to implementation in the eNB.  
- Intel understand that eNB will handle this issue by implementation and it would be good to clarify in stage 2.  
- Huawei think in this case it is worth to capture eNB behaviour in our specification.  
- Nokia think we don't need to capture this in the specification. May stil be woith considering the option of the UE reporting both.  
- Qualcomm can also leave this to eNB implementation.  
=> The eNB handles the backward compatibility by the implementation, and additional description in specification is not needed.

### Other capability related

[R2-162280](#) Corrections on capability report for eCA Huawei, HiSilicon draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_CA\_enh\_b5C-Core  
- Qualcomm support the CR.  
=> Agreed in principle.

[R2-162876](#) Clarification on eCA capability QUALCOMM draftCR 36.331 13.1.0- - F Rel-13  
LTE\_CA\_enh\_b5C-Core

- Huawei think the change to 2DL/1UL is not needed and the other changes are not needed as they are covered according to current text "(except where conflicting with rules defined below"
- Nokia do not want to change the 2DL/1UL requirement. Qualcomm think that if the eNB has requested skip fallback then the UE knows that the eNB is a new eNB that doesn't need all the 2DL/1UL combinations. Intel think this can lead to a backward compatibility issue.
- Ericsson think the current text is very difficult to read as it is.
- Qualcomm would like to revisit the 2DL / 1UL case, at least for the fallback skip case.
- => Postponed.
- => 2DL/1UL requirement can be discussed offline
- => Offline effort to improve the readability of the current text and can be submitted to the next meeting.

[R2-162281](#) The linking between the capability of extension measobject and eCA capability Huawei, HiSilicon discussion

- Nokia think that it doesn't make sense to support 16 CC but not the extended measurement object.
- Ericsson also has some concern relating to RAN4 requirements on number of parallel carriers.

=> a UE supporting of capability for extension measobject shall also support the capability for measID extension.

=> The capability for extension measobject must be supported by UEs supporting more than 5 CC.

[R2-162282](#) Corrections on capability linking for measurement object extension Huawei, HiSilicon draftCR 36.306 13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core

=> Revised in [R2-163083](#).

=> To be updated to capture the agreements from [R2-162281](#)

[R2-163083](#) Corrections on capability linking for measurement object extension Huawei, HiSilicon draftCR 36.306 13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core [R2-162282](#)

=> Agreed in principle

[R2-162668](#) Implementation of UE capability on Harmonic Trap Filter NTT DOCOMO INC. discussion Rel-13 LTE\_CA-Core, TEI13

=> Noted

[R2-162693](#) UE capability of an additional Rx and Tx requirement for a CA band combination NTT DOCOMO, INC. draftCR 36.306 13.1.0- - F Rel-13 LTE\_CA-Core, TEI13

=> Agreed in principle

[R2-162694](#) UE capability of an additional Rx and Tx requirement for a CA band combination NTT DOCOMO, INC. draftCR 36.331 13.1.0- - F Rel-13 LTE\_CA-Core, TEI13

- Ericsson think that the choice structure prevents the eNB from uploading both formats to the MME. So think the choice is not needed. Samsung ask if the eNB could upload to the MME 2 containers, one in old format and one in new format. Ericsson think today it is possible to provide both formats to the MME in one container.

=> Offline discussion to conclude whether to use the choice structure.

- DOCOMO gave an update of the offline. Companies want more time to check

=> Postponed to the next meeting

[R2-162872](#) Definition of a fallback band combination NTT DOCOMO, INC. draftCR 36.306 10.15.0

- - F Rel-10 LTE\_CA-Core
- ZTE think this is only needed for R13. Qualcomm agree it is only needed for R13.
- DOCOMO think that we introduced a requirement for fallback from release 10. From release 13 we have added the signalling enhancement to skip the fallback combinations.
- Intel think there is nothing wrong in R10 and we don't need this change here.

=> Not pursued.

=> The definition will be added only from R13.

[R2-162873](#) Definition of a fallback band combination NTT DOCOMO, INC. draftCR 36.306 11.13.0

- - A Rel-11 LTE\_CA-Core

=> Not pursued.

[R2-162874](#) Definition of a fallback band combination NTT DOCOMO, INC. draftCR 36.306 12.8.0-  
- A Rel-12 LTE\_CA-Core  
=> Not pursued.

[R2-162875](#) Definition of a fallback band combination NTT DOCOMO, INC. draftCR 36.306 13.1.0-  
- A Rel-13 LTE\_CA-Core  
=> "The number of downlink and uplink" to be changed to "The number of downlink or uplink..." - final wording can be further revised offline.  
=> Revised to Cat F in [R2-163084](#)

[R2-163084](#) Definition of a fallback band combination NTT DOCOMO, INC. draftCR 36.306 13.1.0-  
- F Rel-13 LTE\_CA-Core, TEI13 [R2-162875](#)  
=> Agreed in principle

[R2-162879](#) Assumption of UE radio access capabilities for skipped fallback band combinations NTT DOCOMO, INC. draftCR 36.306 13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core  
=> Agreed in principle

#### Other

[R2-162182](#) Clarification on measurement configuration HTC Corporation draftCR 36.331 13.1.0- -  
F Rel-13 LTE\_CA\_enh\_b5C-Core  
- Nokia understand that our practice is not to include ListExt in the field descriptions.  
- Some editorials are not covered in the Nokia CR.  
=> Not pursued  
=> Editorial correction can be included in revision of [R2-162976](#)

[R2-162672](#) Some eCA related corrections Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331  
13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core  
=> Revised in [R2-162976](#)

[R2-162976](#) Some eCA related corrections Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331  
13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core [R2-162672](#)  
- Samsung ask if it is clear that for the critical extensions then fallback to the original version must be done by fullConfig. These new cases may need to be added to the existing statements.  
=> Add editorials from [R2-162182](#). Other details can be further discussed offline.  
=> Revised in [R2-163085](#)

[R2-163085](#) Some eCA related corrections Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331  
13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core [R2-162976](#)  
=> Agreed in principle

[R2-162204](#) Inter-node signalling HTC Corporation draftCR 36.331 13.1.0- - F Rel-13  
"LTE\_CA\_enh\_b5C-Core, LTE\_WLAN\_radio-Core, LTE\_WLAN\_radio\_legacy-Core  
- Nokia wonders of the WLAN parameters need to be transferred. Only the SCelladdmod needs to be transferred.  
- Ericsson think that for interworking some of the parameters need to be forwarded. Samsung have the same view.  
- Ericsson ask why the status report should be forwarded to the target. HTC understand that the UE does not reset this at hadover and hence will not send a new status report. HTC understand that in R12 DC we still forward the configuration even though we don't support handover with SCG change. BlackBerry think we could have done it in the same way as DC but we decided not to.  
=> LWA and LWIP configuration removed from the CR  
=> Discuss offline whether it is useful to include the statusIndication for RCLWI case.  
=> Discuss offline whether to use extension marker or non-critical extension.  
=> Impact analysis to be added  
=> Revised in [R2-163086](#)

[R2-163086](#) Inter-node signalling HTC Corporation draftCR 36.331 13.1.0- - F Rel-13  
"LTE\_CA\_enh\_b5C-Core, LTE\_WLAN\_radio-Core, LTE\_WLAN\_radio\_legacy-Core [R2-162204](#)

=> Agreed in principle

[R2-162609](#) AS-config updates in Release 13 Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331  
13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core, LTE\_WLAN\_radio\_legacy-Core  
- Samsung explain e have not been consistent and sometimes use non critical extnsion and  
sometimes use extension markers.  
=> Merged with [R2-163086](#)

[R2-162953](#) Clarification and Correction on the CIF for R13 CA Beijing Xinwei Telecom Techn. draftCR  
36.331 13.1.0- - F Rel-13 LTE\_CA\_enh\_b5C-Core  
for replacing withdrawn CR in [R2-162416](#)  
- Nokia think that this is not correct.  
=> Not pursued.

**Withdrawn:**

[R2-162416](#) Clarification and Correction on the CIF for R13 CA Beijing Xinwei Telecom Techn. CR  
36.331 13.1.02119 - F Rel-13 LTE\_CA\_enh\_b5C-Core

## 7.3 WI: Single-Cell point-to-multipoint transmission

(LTE\_SC\_PTM-Core, leading WG: RAN2, REL-13; started: June 15, closed: Dec. 15, WID: [RP-151110](#))

[R2-162179](#) Clarification on SC-PTMHTC Corporation draftCR 36.331 13.1.0- - F Rel-13  
LTE\_SC\_PTM-Core  
=> Impact analysis to be added.  
=> Agreed in principle in [R2-163087](#)

[R2-162270](#) FDD-TDD differentiation for SC-PTM capabilities Huawei, HiSilicon discussion  
- Intel agree there are no specific RAN 1 requirements that are different for TDD/FDD, but  
this should be more set on market requirements.  
- Qualcomm think the feature is similar to MBMS and there is an different FDD and TDD  
capability for MBMS.  
- ZTE understand that for MBMS there are TDD and FDD differences due to MBSFN  
measurements.  
- Nokia ask if there are market requirements that we could use for a decision. Ericsson  
agree and wonder why it is bad to define different capabilities. Samsung think that  
currently the signalling doesn't support it and so signalling differences would be required.  
=> Noted  
☒ **[93#19][LTE/TDD/FDD capabilities] (Huawei)**  
Discuss the need for different FDD/TDD capabilities for those added in R13  
Intended outcome: Email discussion report and draft CR to next meeting  
Deadline: Thursday 05/05/2016

[R2-162271](#) FDD-TDD differentiation for SC-PTM capabilities Huawei, HiSilicon draftCR 36.331  
13.1.0- - F Rel-13 LTE\_SC\_PTM-Core  
Not treated

[R2-162272](#) SC-PTM reception on non-PCell Huawei, HiSilicon draftCR 36.302 13.1.0- - F  
Rel-13 LTE\_SC\_PTM-Core  
=> Agreed in principle

[R2-162273](#) System information acquisition for SC-PTM reception on non-PCell Huawei, HiSilicon  
draftCR 36.331 13.1.0- - F Rel-13 LTE\_SC\_PTM-Core  
- Nokia ask if any SC-PTM capable UE should be able to acquire system info from  
neighbour cells. Huawei think this was a decision we made in the past when we added  
MBMS reception for a SCell. Nokia understand this case is different as it may be a non  
serving cell.  
=> First change to be removed  
=> In second change "or" is sufficient  
=> Agreed in principle in [R2-163088](#)

- [R2-162881](#) MBMS reception via MBSFN or SC-PTM Nokia, Alcatel-Lucent Shanghai Bell draftCR  
36.306 13.1.0- - F Rel-13 LTE\_SC\_PTM-Core  
- Intel asks if this is the correct terminology for differentiating. Nokia explain this is aligned to current usage in this spec. ZTE think this is ok and aligned with stage 2.  
=> 'Reception' to be removed from section 4  
=> 4.5.3.2 to be reworded to ensure it doesn't imply mandatory linking between MBSFN and SC-PTM. Details to be worked offline.  
=> Impact analysis to be added.  
=> Revised in [R2-163089](#)
- [R2-163089](#) MBMS reception via MBSFN or SC-PTM Nokia, Alcatel-Lucent Shanghai Bell draftCR  
36.306 13.1.0- - F Rel-13 LTE\_SC\_PTM-Core [R2-162881](#)  
=> Agreed in principle

## 7.4 WI: Further LTE Physical Layer Enhancements for MTC

(LTE\_MTCe2\_L1-Core, leading WG: RAN1, REL-13; started: Sep. 14, closed: Mar. 16, WID: [RP-150492](#))

Including output of email discussion [93#38][LTE/MTC] R8-13 Mandatory features (DOCOMO)

### Incoming LSs:

- [R2-162132](#) LS on RRC parameters for LTE eMTC ([R1-161545](#); contact: Ericsson) RAN1 LS in  
to: RAN2 Rel-13 LTE\_MTCe2\_L1-Core  
- Taken into account in CRs from our last meeting  
- Intel found a few issues that might need to be addressed in field descriptions in RRC.  
=> Some detailed checking offline to ensure that our specs are aligned. Any issues that need to be fixed can be addressed in an appropriate CR.  
=> Noted
- [R2-162133](#) Reply LS to [R2-153973](#), [R2-153966](#) and [R2-161788](#) on Paging Enhancements (R3-160516; contact: Huawei) RAN3 LS in  
to: RAN2 Rel-13 LTE\_MTCe2\_L1-Core, TEI13  
*Above 2 LSs moved from 3.2*  
- Nothing for RAN2 to do to take this into account  
=> Noted
- [R2-162147](#) LS on PRACH preamble power for eMTC (R1-163791; contact: Ericsson) RAN1 LS in  
to: RAN2 Rel-13 LTE\_MTCe2\_L1-Core  
late  
=> CR can be submitted to the next meeting  
=> Noted

### Output of email discussion [93#38][LTE/MTC]:

- [R2-162864](#) Summary of email discussion [93#38][LTE/MTC] R8-13 Mandatory features NTT DOCOMO, INC. report  
late  
P1
- Huawei think that MTC UEs will likely be single RAT and hence FGI 8 and 9 don't need to be changed. DOCOMO think this is likely but from spec point of view it is possible for MTC UEs to support UTRA.
  - Sequans are about the notes if we remove the conditions. Chair thinks the conditions linking different FGI bits could remain but the ones related to mandatory support would be removed.
  - DT ask why we revisit this field where they have been set to 'yes'. DOCOMO explain that MTC changes the phy significantly and IOT may not be available for MTC case even if it is available for LTE.
  - Huawei ask what if the complexity for UE to support FGI 14 (event A4/5). Samsung explain it is not complexity by IOT availability. Prefer to keep FGI as supported. Samsung asks what it would mean if UE is required to set FGI to yes but it has not been able to IOT.
  - Huawei see that mobility is quite essential for MTC and hence these features should be supported.
  - Nokia think that IOT may not be available and hence the proposal 1 is fine. Ericsson agree. Vodafone also support this.
- P2

- Huawei suggest that RAN1 discuss crs-InterfHandl-r11, ss-CCH-InterfHandl-r11 and noResourceRestrictionForTTIBundling-r12. Intel assume that during the email people checked with RAN1 colleagues. DOCOMO agree with Intel. Nokia also agree.
- Huawei agree that crs-InterfHandl-r11, ss-CCH-InterfHandl-r11 are optional for Cat 0 but not sure about noResourceRestrictionForTTIBundling-r12.

#### Agreements

- 1: FGI 8, 9, 13 and 14 are mandatory but remove the condition of the current bit setting (i.e., set to Yes) for Category M1. These are IOT bits that can be set to no or yes.
- 2: FGI 15, 17, 18, 21 to 29, 39, 41, crs-InterfHandl-r11, ss-CCH-InterfHandl-r11 and noResourceRestrictionForTTIBundling-r12 are optional for Category M1.
- 3: Mandatory/optional support of FGI 1, 2 and 115 is consulted by RAN1. Also ask RAN1 to check the decision on crs-InterfHandl-r11, ss-CCH-InterfHandl-r11 and noResourceRestrictionForTTIBundling-r12

=> LS to RAN1 to be provided in [R2-163061](#) (DOCOMO)

[R2-163061](#) [Draft] LS on reviewing all LTE features up to Rel-13 for Category M1 Ues (to: RAN1; cc: -; contact: NTT DOCOMO) NTT DOCOMO LS out Rel-13 LTE\_MTCe2\_L1-Core

=> Approved in [R2-163108](#)

#### [R2-162213](#)

Discussion on FGI/IOT bit for Cat.M1 Qualcomm Incorporated discussion

##### P1

- Intel share the view of Qualcomm but wonder if 2 bits might be useful, one for CE mode A and one for CE mode B. Understand that RAN4 is prioritising performance reqs for CE mode A. Ericsson understand that March spec has requirements for CE mode B.
- Samsung understand that intra-freq handover is mandatory for CE mode A. Can consider an IOT bit should only be for CE mode A. Assume no handover for CE mode B. Qualcomm have a similar understanding.
- Huawei think the measurements could be supported in CE mode B
- Intel checked again and understand that CE mode B may have performance requirements for intra-freq but inter-freq is out of the question.

##### P4

- Qualcomm clarify the current FGI16 refers to periodical for all measurement types. The proposal is to discuss whether it is useful to have a separate FGI for serving cell measurements only.
- => P4 can be discussed more offline.
- Qualcomm gave an update on the offline. There is little support for the proposal.

#### Agreement

- 1: Introduce a new IOT bit for intra-frequency handover in CE mode A
- 2: Introduce a new IOT bit for measurement reporting event A3 for CE mode A.
- 3: Change the “mandatory” conditions of FGI#16 so that they are not applicable to Cat.M1 UEs.

Note: 1 and 2 for CE mode B can be discussed after support for intra0freq handover in CE mode B is discussed.

#### Stage 2 corrections

#### [R2-162525](#)

Correction to eMTC message classes and logical channels Ericsson discussion

- LG ask if one UE can configure both legacy and BR BCCH. If it doesn't happen at the same time then is there any ambiguity. Ericsson thinks this works but it is not a good way to model it.
- Samsung is not sure that we need this. It is like a separate instance of BCCH.
- Huawei share the same view as Samsung. Could be discussed more offline.
- Qualcomm support this. If could become difficult in future if we have these multiple instances of BCCH. May need to revisit in future. DOCOMO have some sympathy for the proposal.
- => Can be discussed offline (Ericsson)
- Ericsson gave update on the offline. The discussion did not conclude.
- Intel ask if this approach would have impact on NB-IOT.
- => Postponed to the next meeting.

- [R2-162521](#) Correction to eMTC message classes and logical channels Ericsson draftCR 36.300  
13.3.0- - F Rel-13 LTE\_MTCe2\_L1-Core
- [R2-162522](#) Correction to eMTC message classes and logical channels Ericsson draftCR 36.321  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core
- [R2-162523](#) Correction to eMTC message classes and logical channels Ericsson draftCR 36.331  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core
- [R2-162632](#) Correction to eMTC message classes and logical channels Ericsson draftCR 36.304  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core  
Above 4 Tdocs not treated
- [R2-162840](#) Stage 2 aspects of HARQ functionality for eMTC UEs Ericsson draftCR 36.300 13.3.0-  
- F Rel-13 LTE\_MTCe2\_L1-Core  
=> The () to be removed from (M)PDCCH when re-submitted to RAN2#94  
=> Agreed in principle.
- [R2-162283](#) The improvements for the representation of eMTC features Huawei, HiSilicon draftCR  
36.302 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core  
- Intel think in the representation it uses the same label for the reception type. Confusing to  
which reception type it refers. Suggests separate labels.  
=> To be revised to include separate label for the reception type for LTE and MTC.  
=> Revision in [R2-163062](#)
- [R2-163062](#) The improvements for the representation of eMTC features Huawei, HiSilicon draftCR  
36.302 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162283](#)
- [R2-163144](#) The improvements for the representation of eMTC features Huawei, HiSilicon draftCR  
36.302 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162283](#)  
=> Agreed in principle
- [R2-162537](#) Corrections to MTCe in TS 36.300 Intel Corporation draftCR 36.300 13.3.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core  
late  
=> Agreed in principle

#### Connected mode mobility

- [R2-162370](#) Measurement gap for intra-frequency measurement with narrowband operation Qualcomm  
Incorporated discussion  
P2
- Samsung asks if there is a need for independent capability for intra and inter. Qualcomm propose that it is a single common capability for both inter and intra.
  - Ericsson this it will not be possible to signal a different setting for intra and inter. Qualcomm think from UE implementation it is much the same thing as a separate RF chain is needed.
  - Samsung explain the current gap is 6 subframes but not sure that the current gap will be sufficient for CE mode B.
- => Discuss offline whether a separate capability for intra-freq gaps is needed. Conclusion may be to send LS to RAN4.

#### Agreements

- 1: Correct the stage-2 description to cover the narrowband operation where the UE requires measurement gap for intra-frequency measurement.

- [R2-162490](#) CONN mobility support for Mode B Samsung Research America discussion
- Ericsson that RAN4 is still looking at what performance requirements will be defined. If RAN4 don't complete the requirements then it will not be supported but we don't rule it out on RAN2. Ericsson also think that it is not clear what will not be supported in terms of the signalling, measurements, etc.
  - Huawei also think that low speed mobility may be supported but it is better to leave it to network implementation.
  - Samsung wonders if some UEs will be designed for no mobility and CE Mode B operation.
  - Chair think the proposal is related to the type of UE and not CE mode.
  - Intel think this type of UE could be considered.

- Ericsson think we could have an IOT bit for handover in CE mode B (as well as A) but the signalling will remain. Qualcomm support the suggestion from Ericsson.
  - Panasonic asks if anything is broken if the eNB is just not informed that UE doesn't support mobility. UE just doesn't provide measurements.
  - Samsung ask how handover can work as the target cell doesn't know what CE mode will be used in the target cell when it prepares the handover. Intel think we would need to clarify that UE starting in CE mode A would not be expected to handover to CE mode B.
- => Can discuss more offline. (Samsung)
- Samsung gave update from offline. IOT bit and new UE type were discussed. All companies supported a new IOT bit for CE mode B.

#### Agreements

- 1 Add a new IOT bit for handover when UE is configured in CE mode B - target cell may be NC, mode A or B. This bit can only be set if bit 2, 3 is set.
- 2 Add a new IOT bit for event A3 when UE is configured in CE mode B
- 3 For the already agreed IOT bit for CE mode A the target cell may be NC and mode A

#### Idle mode mobility

[R2-162539](#) Corrections to MTCe in TS 36.304 Intel Corporation draftCR 36.304 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core

- 5.2.4.6a has a different proposal from [R2-162585](#)

=> To be merged with revision of [R2-162585](#)

[R2-162585](#) Corrections on cell reselection and mode selection Huawei, HiSilicon draftCR 36.304  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Sony understand the intent is to change the requirement to be not based on just ranking but to include coverage level of the neighbour cell. Huawei explain that this is not the intention - it is just to point to the cell selection criteria to explain how the UE determines that the UE is CE mode. "After applying ranking criterion" could be clarified to say " During applying ranking criterion "

=> Add text to clarify that 5.2.4.6 applies in NC and EC - details of the text can be worked offline.

=> Change "After applying ranking" to ".When applying ranking"

=> Revision in [R2-163063](#)

[R2-163063](#) Corrections on cell reselection and mode selection Huawei, HiSilicon draftCR 36.304  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162585](#)

=> Postponed to next meeting.

#### System information

[R2-162542](#) SI acquisition for UEs in CE mode A Intel Corporation discussion

- Ericsson think this would limit the network in some configurations, e.g. limits the network to go with every radio frame, every 2nd radio frame, etc. Also all SI message must use the same configuration.
- Intel thinks that a UE supporting only CE mode A may still combine across windows. Ericsson agree for UE but from network side it has to schedule for worst case to fit all repetitions within one SI window and might end up having to use all radio frames.
- Huawei thinks this would need some evaluation in RAN1. Don't think the buffer management is a big problem for the UE.
- Samsung agree with the proposal. Qualcomm support the proposal.
- DOCOMO can see benefit from UE perspective but agree from network side it is difficult to schedule and has some concern.
- Ericsson think that RAN1 previously agreed up to 4 broadcast processes. This would not have any meaning for these UEs.

=> Offline discussion. (Intel)

- Intel gave summary of offline discussion. There was little support for the proposal.

=> Noted

[R2-162589](#) Corrections on SIB supporting and SI acquisition Huawei, HiSilicon draftCR 36.331  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Intel don't see the need to capture anything for MBMS SIB as it is already clear that MBMS is not supported. Also for these SIBs there is no CR version. Huawei agree but think it is not too clear.
  - Ericsson thinks these features are anyway optional for all UEs.
  - Intel explain editorial is already captured
- => Not pursued

[R2-162594](#) Correction on system information handling in eMTC HTC Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Ericsson think we have not discussed whether at re-establishment the UE can rely on what it has based on previous discussion that it doesn't keep up to date system info in connected.
- Intel think the change in 5.2.2.3 is not needed. Ericsson agree. Samsung think it may be needed in case we decide to describe the re-establishment case.

=> Can be discussed offline, in particular to consider the re-establishment case.

=> Revision in [R2-163065](#)

[R2-163065](#) Correction on system information handling in eMTC HTC Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162594](#)

- Intel understand that reestablishment of the current cell then there should be now need to acquire the system information again but it would need to acquire it if the UE moves to another cell.

=> Postponed

[R2-162656](#) CR on SI window combining for eMTC NTT DOCOMO INC. draftCR 36.331 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

=> Agreed in principle

[R2-162836](#) Discussion on valid subframes for FDD and TDD DL transmissions Ericsson discussion

- Huawei is ok but think the current description has the same meaning.
- Qualcomm supports the change but thinks the condition for SIB2 may not be needed.

=> We will attempt to clarify this in the spec.

[R2-162837](#) Valid subframes for FDD and TDD DL transmissions Ericsson draftCR 36.331 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Intel ask whether we should also clarify about the content being a superset of the MBSM subframes.

=> Remove " mbsfn-SubframeConfigList may or may not be indicated if the field is present."

=> Add text to clarify the content of the bitmap.

=> Revision in [R2-163066](#)

[R2-163066](#) Valid subframes for FDD and TDD DL transmissions Ericsson draftCR 36.331 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162837](#) [R2-163073](#)

=> Agreed in principle

#### Other RRC

[R2-162803](#) Further discussion on NAS timers for CE Ericsson discussion

- Intel has a similar view to Ericsson, and also proposes some of the RAN2 timers could be re-discussed. Think the current CE mode could be provided to the NAS before establishment but also if the CE mode is reconfigured. Intel think we could ask CT1 is they want to know about CE mode changes during the connection.
- ZTE ask if the S1 signalling is anyway needed. Ericsson think the details of how the information is encoded can be discussed RAN3.
- Qualcomm is concerned that the mode might be reconfigured for example at handover.
- Samsung ask how often the change of CE mode can occur.
- DOCOMO think we need to discuss whether we support use cases where the CE mode changes during a connection. Ericsson think it is simpler if we don't need to worry about CE mode changes in a connection.
- Samsung think that even in the simple case the NAS might be given an estimate of the CE mode but then it changes during the RACH

|             |
|-------------|
| Agreements: |
|-------------|

- 1 NAS should be aware that a UE only capable of CE mode A. RAN2 understanding is that legacy timers would be suitable.

Tentative agreements:

- 2 For a UE that supports CE mode A and CE mode B: Two levels of CE information will be provided to NAS. 1/ UE in NC or CE mode A. 2/ UE in CE mode B
- 2a On UE side the NAS can be informed by UE internal signalling at connection establishment.  
FFS when exactly during the connection establishment the CE information will be available in UE.
- 2b On network side, the CE information should be provided in the S1 message carrying Initial NAS message
- 3 Ask CT1 if it is useful for NAS to be informed during an RRC connection that the CE mode has been reconfigured.

=> The tentative agreements can be discussed mode offline (Ericsson)

[R2-162996](#) Way forward on NAS timer setting Ericsson discussion late

=> Noted

✉ **[93#05][LTE/MTC/NB-IOT] NAS timer extension (Ericsson)**

Discuss the proposal in R2-162996. Discuss in the scope of MTC and NB-IOT

Intended outcome: Email discussion report to NB-IOT ad-hoc

Deadline: Thursday 28/04/2016

[R2-162877](#) Usage of extended vs legacy range of timers for eMTC UEs Intel Corporation discussion

- Only proposal 2 discussed.
- Qualcomm think this has the same issue as identified for NAS. The timer can be started before the random access.

=> Noted

[R2-162804](#) T310 timer for eMTC Ericsson discussion

- ZTE ask a bout a UE that supports CE mode B but operating in CE mode A. Ericsson clarify that in case UE is operating in CE mode A then it would be set using the legacy value range.
- Samsung if it is a problem that the UE could be continuing UL periodic transmission for a long time.
- Nokia as if the CE mode changes does the UE switch value. Ericsson explain that it is configured by the eNB so it is eNB choice to change the value. Nokia think that after a HO the UE may not have an appropriate setting until the eNB has reconfigured the UE.

=> Noted

[R2-162805](#) T310 timer for eMTC Ericsson draftCR 36.331 13.1.0- - F Rel-13

LTE\_MTCe2\_L1-Core

Not treated

[R2-162518](#) Establishment Cause for non NB-IoT UE NTT DOCOMO INC. discussion

- KDDI ask if RAN2 should discuss this proposal now. Should discuss after NB-IOT has concluded.
- Intel wonder what is the use case of exceptional data for normal UEs, but for MTC UEs we have the delay tolerant UEs.
- KDDI agrees with Intel's comment. RAN2 should be careful to use the last cause.
- Qualcomm assume that this cause would only be applicable if the UE supports CIoT optimisations.
- Nokia think the proposal is a mapping for normal and exceptional report. Think that it might not be needed given the ASN.1 structure discussion this morning.
- ZTE tend to agree that we should wait for NB-IOT

=> Revisit discussion after NB-IOT has made more progress.

- Ouput from offline discussion concluded during TEI13 discussions on CIOT.

=> Noted

[R2-162524](#) [DRAFT] Response to LS on NB-IoT work progress in RAN2 NTT DOCOMO INC. LS out Not treated

[R2-162584](#) Corrections on nB extension Huawei, HiSilicon draftCR 36.304 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Intel ask if we need the field name " paging-narrowBands-r13". We don't reference field names very often in 304

=> Remove " paging-narrowBands-r13"

=> With change above the CR is agreed in principle in [R2-163067](#)

[R2-162631](#) Allowing different frequency bands between eMTC/NB-IoT UEs and legacy UEs NTT DOCOMO, INC. discussion

- Samsung think a normal UE capable of CE operation will read a different FBI from SIB1 in NC from that read in CE mode. How do we handle this case.
- Intel think the issue was also discussed in RAN4. Think it is up to RAN4 to conclude before we can take a decision. Samsung is ok to wait for RAN4.
- Samsung think that we can use the MFBI in the SIB1-BR so wonder if there is a problem.
- DOCOMO think this is not a RAN4 issue. DOCOMO think that if network wants to apply CE for normal UEs, MFBI can be used to indicate the band of the full b/w cell as well as the SIB1 BR.
- Ericsson think we did add some sentences where we say the network should configure things to the same value in SIB1 and SIB1-BR.

=> Offline discussion to conclude whether there is any issue for a normal UE if it received different FBI from SIB1 and SIB1-BR (DOCOMO)

- DOCOMO gave update from offline. There are still long discussion in RAN4 so this should be postponed

=> Postponed to next meeting.

[R2-162802](#) Miscellaneous eMTC corrections Ericsson draftCR 36.331 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Some of the corrections overlap with the Intel CR.

=> mac-ContentionResolutionTimerList should be corrected as this field does not exist in the ASN.1 anymore.

=> With changes above the CR is agreed in principle in [R2-163068](#)

late

[R2-162541](#) Corrections to MTCe in TS 36.331 Intel Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

late

=> The overlapping parts compared to the Ericsson CR can be removed.

=> With changes above the CR is agreed in principle in [R2-163069](#)

## User plane

### Random access

[R2-162362](#) Modification of RA-RNTI formula ZTE draftCR 36.321 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- LG think it is not necessary to save RA-RNTI values only for FDD and so the current formula is ok.
- Samsung think was never done previously in legacy text.

=> Not pursued.

[R2-162588](#) Correction on preamble group selection and RA-RNTI value range Huawei, HiSilicon draftCR 36.321 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Also the number in the table are not correct. Huawei think the correct behaviour is to increase the CE level. Ericsson think that in congestion it can happen that all UEs increase their CE level, increasing their number of repetitions.
- HTC think that when CE level changes the UE should change the PRACH resource immediately.
- LG think the current text is correct.

- Ericsson don't think this is the correct behaviour. The behaviour of performing preamble selection when changing CE level is included in the Ericsson CR.

=> Table to be fixed offline.

=> Revision in [R2-163070](#) to fix the table in 7.1

[R2-163070](#) Correction on preamble group selection and RA-RNTI value range Huawei, HiSilicon  
draftCR 36.321 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162588](#)

=> Table needs to be captured but other changes will be removed

=> Agreed in principle in [R2-163141](#)

[R2-162590](#) Preamble transmission counter update for contention resolution fail Huawei, HiSilicon  
discussion

- Nokia think this has been discussion before and CR failure can occur due to coverage or collision. In case of collision increasing the CE level doesn't help. Huawei think this is not aligned with RAN1 agreement. Ericsson think it should not be up to RAN1 to decide behaviour on contention resolution failure.
- HTC think there is no conflict between RAN1 and RAN2 and the change not needed.
- Samsung think the Huawei proposal is in line with RAN1 agreement. Ericsson think it is not in line with RAN2 agreement.

=> Noted

[R2-162591](#) Preamble transmission counter update for contention resolution fail Huawei, HiSilicon  
draftCR 36.321 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core

=> Discuss offline (Huawei)

- Huawei gave update from offline which included that the current spec was ok.

=> Not pursued

[R2-162842](#) Starting CE level for PDCCH order and HO Ericsson draftCR 36.321 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core

- LG agree with the intention but prefer the sentence placed before the current RSRP related requirement.
- Intel think we should refer to M-PDCCH order (and possible may affect other parts of the spec)
- Ericsson think we have a general sentence that PDCCH can refer to E/M or normal PDCCH. Ericsson agree that it is confusing if we refer to M-PDCCH here. A general sentence is better. DOCOMO think this is covered in the general text

=> Move text to be above the RSRP related requirements and add 'else'

=> Revision in [R2-163071](#)

[R2-163071](#) Starting CE level for PDCCH order and HO Ericsson draftCR 36.321 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core [R2-162842](#)

=> Replace UE with MAC entity

=> Moved "the UE considers itself to be in that enhanced coverage level regardless of the measured RSRP;" to a separate bullet.

=> Agreed in principle in [R2-163139](#)

## HARQ

[R2-162475](#) Correction on HARQ RTT timer Samsung Research America discussion

- LG think the intent is to start in the last subframe of the PDCCH. Qualcomm agree with LG and think the word 'after' is not so clear.

=> Noted

[R2-162477](#) [Draft CR] Correction on HARQ RTT timer Samsung Research America draftCR 36.321  
13.0.0- - F Rel-13 LTE\_MTCe2\_L1-Core

- Samsung explain the intent to so say "at the end of the subframe".
- Qualcomm think we have never specified whether these MAC timers are started at the end or beginning of the subframe.
- ZTE think in that in some sense the Samsung proposal is correct that it is after the PDCCH is received. LG think we have never specified too much detail.

=> Not pursued

- [R2-162602](#) HARQ RTT Timers in eMTC CATT draftCR 36.321 13.1.0- - B Rel-13  
LTE\_MTCe2\_L1-Core  
NOTE: cat.B used to a closed WI  
=> Cat need to be changed to F  
=> Changes need to be in revision marks.  
=> Impact analysis.  
=> Revision in [R2-163072](#)
- [R2-163072](#) HARQ RTT Timers in eMTC CATT draftCR 36.321 13.1.0- - F Rel-13  
LTE\_MTCe2\_L1-Core [R2-162602](#)  
=> Agreed in principle
- [R2-162526](#) Asynchronous UL HARQ protocol operation Panasonic draftCR 36.321 13.1.0- - F  
Rel-13 NB\_IoT-Core  
replacing withdrawn CR in [R2-162336](#)  
=> Impact analysis to be added  
=> Revision in [R2-163073](#)
- [R2-163073](#) Asynchronous UL HARQ protocol operation Panasonic draftCR 36.321 13.1.0- - F  
Rel-13 NB\_IoT-Core [R2-162526](#)  
=> Agreed in principle
- [R2-162586](#) Correction on DL retransmission and UL transmission Huawei, HiSilicon draftCR 36.321  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core  
- LG think we don't have a definition of 'valid' subframe. Huawei thinks this comes from RAN1.  
=> Remove " in consecutive valid subframes "  
=> With change above agreed in principle in [R2-163074](#)

#### BSR/SR

- [R2-162476](#) Clarification on SR prohibit timer Samsung Research America discussion  
- LG think that there is just one indication from MAC to phy and hence it is clear when the timer is started. Huawei agree LG.  
- Chair understand the current text that the time is started when the indication is given to lower layers and hence is at the start of the bundle transmission.  
- Ericsson ask if we had this understanding when we decided not to extend this timer.  
=> RAN2 understanding is that the current text implies that the timer is started when the indication is given to lower layers and hence is at the start of the bundle transmission.  
=> Can check offline what assumption was used when the timer values were decided.  
- Ericsson gave update from offline. The original assumption was that the timer was only started only after transmission of the bundle of SRs.  
- LG have a different understanding as the SR is transmitted from the MAC point of view when it indicates to L1 and hence it is at the beginning of the bundle.  
=> Issue can be revisited at the next meeting.

- [R2-162478](#) [Draft CR] Clarification on SR-prohibit timer Samsung Research America draftCR 36.321  
13.0.0- - C Rel-13 LTE\_MTCe2\_L1-Core  
NOTE: cat.C used to a closed WI  
=> Not pursued

#### DRX

- [R2-162587](#) Correction on the conditions to start or restart drx-InactivityTimer Huawei, HiSilicon draftCR  
36.321 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core  
- LG thinks this was intentionally not specified, otherwise we need to mention this in many locations. Instead we had a general note (5.7)  
=> Not pursued

#### SPS

- [R2-162838](#) SPS support for eMTC UEs in Rel-13 Ericsson discussion  
P1

- Samsung think this is not in line with legacy for the UL case. In legacy the subframe refers to where the PUSCH is transmitted but now it would relate to where the MPDCCH is received. Ericsson need to check this aspect.
  - Sequans think the proposal can be a bit misleading. In the Sequans CR this aspect is not addressed
  - => Need to be checked offline (Ericsson)
  - Ericsson gave update from offline:
  - => In SPS subframe calculation, SFNstart time and subframestart time refer to the first transmission of PUSCH repetitions.
  - => This and other agreements can be capture in R2-163140
- P2
- Sequans think if the first subframe is not valid then the bundle is postponed. Think that the TTI used for the HARQ process calculation must be the one even if the transmission is postponed.
  - Ericsson thinks if it turns out that the starting subframe is invalid then it is ok. This is just a calculation based on a TTI and it doesn't matter if it is invalid.
- P3
- Agree with the proposal. Can also discuss whether the number of processes is configured by RRC.

**Agreements**

- 1 For DL HARQ process calculation, CURRENT\_TTI refers to the subframe of the first transmission in the repetition bundle (not taking into account whether the subframe is invalid).
- 2 HARQ process ID associated with a TTI is determined with the similar formula in uplink as for downlink for eMTC SPS.

[R2-162839](#) SPS support for eMTC UEs Ericsson draftCR 36.321 13.1.0- - F Rel-13  
LTE\_MTCe2\_L1-Core

=> Revised to [R2-163140](#)

R2-163140 SPS support for eMTC UEs Ericsson draftCR 36.321 13.1.0- - F Rel-13  
LTE\_MTCe2\_L1-Core

=> Postponed to the next meeting

[R2-162848](#) Corrections to UL SPS operation Sequans Communications discussion

- Ericsson think it clear we have 2 options. RRC signalling or a fixed value. If something flexible is needed then the DL and UL value could both use the same value. It would still be possible to use UL and DL SPS separately. Sequans think we would need to configure SPS even if it is not used.
- Samsung ask if we can use all 8 processes for SPS. But the intent in R8 was that we would only use some for SPS leaving the others of dynamic.
- => Offline discussion (Sequans)
- Sequans gave update from offline. There was agreement to have a new parameter to configure the number of UL HARQ processes.
- => Add a new parameter to configure the number of UL HARQ processes

[R2-162849](#) Corrections to UL SPS operation Sequans Communications draftCR 36.321 13.1.0- -  
F Rel-13 LTE\_MTCe2\_L1-Core  
Not treated

[R2-162851](#) Corrections to UL SPS operation Sequans Communications draftCR 36.331 13.1.0- -  
F Rel-13 LTE\_MTCe2\_L1-Core  
=> Replace the condition with text in the field description  
=> Add impact analysis  
=> Postponed to next meeting

**Other MAC**

[R2-162593](#) Correction to MAC procedures for MTC HTC Corporation draftCR 36.321 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core

- => Only change in 5.7 is needed.
- => Check if it is based on latest version of MAC spec.
- => Revision in [R2-163075](#).

[R2-163075](#) Correction to MAC procedures for MTC HTC Corporation draftCR 36.321 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core [R2-162593](#)  
=> Agreed in principle

[R2-162841](#) Minor corrections to MAC for eMTC Ericsson draftCR 36.321 13.1.0- - F Rel-13  
LTE\_MTCe2\_L1-Core  
- Huawei agree with the issue in 5.1.4 but think it is better fixed in 5.1.2.  
- Qualcomm think that the next sentence points to 5.1.2 and the text in 5.1.2 says use the same resource as last time. This addressed by the Huawei proposal.  
- HTC support the Ericsson approach.  
- LG support all the change in the CR.  
=> Discuss offline to conclude the issue addressed in 5.1.2  
=> Other changes are acceptable  
=> Agreed in principle

[R2-162637](#) Correction of BCCH reception for LC-MTC Nokia, Alcatel-Lucent Shanghai Bell draftCR  
36.321 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core  
- Nokia explain that is it agreed in RAN1 that RV changes with every transmission.  
=> Change need to be shown in revision marks.  
=> Should be on spec version 13.1.0  
=> else should also be in revision marks  
=> Revision in [R2-163076](#).

[R2-163076](#) Correction of BCCH reception for LC-MTC Nokia, Alcatel-Lucent Shanghai Bell draftCR  
36.321 13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162637](#)  
=> Agreed in principle

late

[R2-162540](#) Corrections to MTCe in TS 36.321 Intel Corporation draftCR 36.321 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core  
late  
- Ericsson think the intent was to avoid CE abbreviation in MAC due to avoiding confusion with Control Element.  
=> Just fix the cases where CE is used to mean Coelevation Enhancement (instead of changing everywhere)  
=> 7.x and 7.y to be fixed  
=> Revised in [R2-163077](#)

[R2-163077](#) Corrections to MTCe in TS 36.321 Intel Corporation draftCR 36.321 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core [R2-162540](#)  
=> Agreed in principle

[R2-162844](#) Correction on frequency hopping signaling Sequans Communications draftCR 26.331  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core  
late  
- Samsung agree to the problem and that a solution is needed. Ericsson agree a solution is needed.  
- Ericsson would like to check the ASN.1 offline.  
=> Coverage need to be update  
=> Can also be further checking of ASN.1 offline  
=> Revised in [R2-163078](#)  
=> Note should be added to the 3GPP website that a network wanting to use MTC with SI with frequency hopping needs to use 36.331 13.2.0

[R2-163078](#) Correction on frequency hopping signaling Sequans Communications draftCR 36.331  
13.1.0- - F Rel-13 LTE\_MTCe2\_L1-Core [R2-162844](#)  
=> Agreed in principle

**Withdrawn:**

[R2-162336](#) Asynchronous UL HARQ protocol operation Panasonic CR 36.321 13.1.00854 - F  
Rel-13 LTE\_MTCe2\_L1-Core

**R2-162538** Corrections to MTCe in TS 36.302 Intel Corporation draftCR 36.302 13.1.0- - F  
Rel-13 LTE\_MTCe2\_L1-Core  
late

## 7.5 WI: ProSe enhancements

(LTE\_eD2D\_Prox-Core, leading WG: RAN2, REL-13; started: Dec. 14, closed: Mar. 16, WID: [RP-150441](#))

WI complete from RAN2 perspective

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex G.**

- [R2-162155](#) Miscellaneous correction for sidelink Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162156](#) Corrections for sidelink description Huawei, HiSilicon draftCR 36.300 13.3.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162157](#) Corrections for sidelink communication transmission Huawei, HiSilicon, ITRI draftCR  
36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162158](#) Discussion on conditions for Relay and Remote UE operation Huawei, HiSilicon discussion
- [R2-162159](#) Correction on conditions for Relay and Remote UE operation Huawei, HiSilicon draftCR  
36.300 13.3.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162160](#) Correction on conditions for Relay and Remote UE operation Huawei, HiSilicon draftCR  
36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162161](#) Discussion on conditions of sidelink operation Huawei, HiSilicon discussion
- [R2-162162](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162163](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.304 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162164](#) Discussion on sidelink discovery transmission range Huawei, HiSilicon discussion
- [R2-162165](#) Correction on sidelink discovery transmission range Huawei, HiSilicon draftCR 36.300  
13.3.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162166](#) Correction on sidelink discovery transmission range Huawei, HiSilicon draftCR 36.331  
13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162167](#) Correction for sidelink Huawei, HiSilicon draftCR 36.302 13.1.0- - F Rel-13  
LTE\_eD2D\_Prox-Core
- [R2-162168](#) Correction for sidelink capability Huawei, HiSilicon draftCR 36.306 13.1.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162169](#) Correction for sidelink Huawei, HiSilicon draftCR 36.323 13.1.0- - F Rel-13  
LTE\_eD2D\_Prox-Core
- [R2-162170](#) Discussion on sidelink logical channel prioritization Huawei, HiSilicon discussion
- [R2-162171](#) Corrections for sidelink logical channel prioritization Huawei, HiSilicon draftCR 36.321  
13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162172](#) Discussion on carrier priority handling for sidelink relay discovery Huawei, HiSilicon  
discussion
- [R2-162217](#) Corrections on description of commTxAllowRelayCommon CATT draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162218](#) Correction on the conditions for sidelink operation CATT draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162242](#) Corrections on sidelink related description in TS36.302 CATT draftCR 36.302 13.1.0- -  
F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162244](#) LS on Group Destination ID CATT LS out Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162245](#) Clarification on UE behavior when tx gap is overlapped with DL subframe CATT discussion
- [R2-162247](#) Clarification on UE behavior when tx gap is overlapped with DL subframe CATT draftCR  
36.321 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162248](#) Change the Group destination ID to Destination layer-1 ID CATT draftCR 36.300 13.3.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162249](#) Change the Group destination ID to Destination layer-1 ID CATT draftCR 36.321 13.1.0-  
- F Rel-14 LTE\_eD2D\_Prox-Core
- [R2-162337](#) UL SPS operation during Sidelink Discovery gap Panasonic discussion
- [R2-162339](#) UL HARQ Protocol operation during Sidelink discovery gap Panasonic discussion
- [R2-162481](#) Conditions of RRC connection initiation for relay discovery ITRI draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core

- [R2-162482](#) AS-conditions for relay PS related sidelink discovery trans ITRI draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162484](#) Clarification on the usage of threshold conditions for sidelink relay UE ITRI draftCR  
36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162510](#) Miscellaneous corrections for sidelink in 36.331 ZTE Corporation draftCR 36.331  
13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162511](#) Miscellaneous corrections for sidelink in 36.300 ZTE Corporation draftCR 36.300  
13.3.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162513](#) Correction on Relay UE serving multiple sidelinks for one Remote UE ASUSTEK  
COMPUTER (SHANGHAI), CATT, Coolpad, ITL, LG Electronics, Panasonic, Qualcomm  
draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162527](#) UL SPS and Sidelink discovery gap Panasonic draftCR 36.321 13.1.0- - F Rel-  
13 LTE\_eD2D\_Prox-Core
- [R2-162528](#) Clarification on UL SPS during sidelink gap Innovative Technology Lab Co. draftCR 36.321  
13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162533](#) Clarification on the eD2D capability Intel Corporation discussion Rel-  
13 LTE\_eD2D\_Prox-Core
- [R2-162534](#) Clarification on the eD2D capability Intel Corporation draftCR 36.306 13.1.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162798](#) Small eSL related corrections Samsung Telecommunications draftCR 36.331 13.1.0- -  
F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162883](#) Signalling of priorityList-r13Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core
- Withdrawn:**
- [R2-162305](#) Small eSL related corrections Samsung Telecommunications CR 36.331 13.1.02115 -  
F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162338](#) UL SPS and Sidelink discovery gap Panasonic CR 36.321 13.1.00855 - F Rel-  
13 LTE\_eD2D\_Prox-Core
- [R2-162403](#) Miscellaneous corrections for sidelink in 36.331 ZTE Corporation CR 36.331 13.1.0  
2118 - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162404](#) Corrections on description of PC5 control plane in 36.300 ZTE Corporation CR 36.300  
13.3.00864 - F Rel-13 LTE\_eD2D\_Prox-Core
- [R2-162489](#) Clarification on UL SPS during sidelink gap Innovative Technology Lab Co. CR 36.321  
13.1.00856 - F Rel-13 LTE\_eD2D\_Prox-Core

## 7.6 WI: LTE-WLAN Radio Level Integration

(LTE\_WLAN\_radio-Core, leading WG: RAN2, started: Mar. 15, closed: Mar. 16, WID: [RP-152213](#))

### 7.6.1 LTE+WLAN Aggregation

#### Stage 2 corrections

- [R2-162449](#) Miscellaneous Stage-2 corrections for LWA Intel Corporation draftCR 36.300 13.3.0- -  
F Rel-13 LTE\_WLAN\_radio-Core  
Revised to [R2-162974](#)
- [R2-162974](#) Miscellaneous Stage-2 corrections for LWA Intel Corporation draftCR 36.300 13.3.0- -  
F Rel-13 LTE\_WLAN\_radio-Core
- Revision aligns the Xw message names with RAN3.
  - Qualcomm think for the authentication some sentence is needed for the case that the UE is already connected. Qualcomm thinks that we could support DC with SCG bearer can be mapped to WLAN. Intel had so far assumed this is not supported simultaneously. BlackBerry agree that they are not supported simultaneously. Ok to capture this in stage 2 but it also need to be clear in stage 3. Ericsson agree that something for DC and LWA combination is needed in RRC as well.
  - BlackBerry ask if the change on authentication is aligned to stage 3.
  - Qualcomm suggest not including the explanation of procedures in 22B. Should come from RAN3.
- => Reference to 33.401 should be 33.402
- => Remove changes in 22B other than the names.
- => Some editorials to address.

- [R2-163090](#) => Revised in [R2-163090](#)  
Miscellaneous Stage-2 corrections for LWA Intel Corporation draftCR 36.300 13.3.0- -  
F Rel-13 LTE\_WLAN\_radio-Core [R2-162974](#)  
- BlackBerry would like to send and LS to SA3. Intel think it is ok to notify SA3.  
=> Agreed in principle
- [R2-163136](#) Draft LS on SA3 on LWA stage 2 security related changes Draft LS to SA3 Ericsson  
- Qualcomm think that the LS is not needed.  
✓ => Approved in [R2-163142](#)
- [R2-162987](#) Avoiding simultaneous configuration of LWA and DC for a UE Intel Corporation draftCR  
36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core  
=> Agreed in principle
- [R2-162970](#) Further clarification on WLAN authentication procedure for LWA Intel Corporation  
discussion  
late  
- BlackBerry ask if the trigger for re-association is aligned with stage 3 and is the sentence  
needed. Qualcomm think if a new key is received then UE has to reassociate.  
=> "Key derived using the WT Counter value" needs to add 'and eNB key'  
=> Some checking offline can be done, including aspect whether the reassociation  
requirement is needed.  
=> Text will be included in [R2-163090](#)
- [R2-162955](#) Clarification of WLAN authentication for LWA QUALCOMM CDMA Technologies draftCR  
36.300 13.3.0- - F Rel-13 LTE\_WLAN\_radio-Core  
for replacing withdrawn CR in [R2-162908](#)  
=> Not treated as covered by previous discussion
- [R2-162203](#) Remaining issues in LWA HTC Corporation discussion  
=> Noted
- [R2-162173](#) Clarification on LWA HTC Corporation draftCR 36.300 13.3.0- - F Rel-13  
LTE\_WLAN\_radio-Core  
- Intel don't see the need to add the DL only clarification in the bearer definition. Huawei  
have the same view. Qualcomm agree.  
=> No change to the definitions  
=> Agreed in principle in [R2-163091](#)
- [R2-162297](#) QoS handling by WT Samsung draftCR 36.300 13.3.0- - Rel-13  
LTE\_WLAN\_radio-Core  
- Ericsson think that RAN3 agreed that it is up to the Wt to map this. Qualcomm confirm this  
was discussed in RAN3 and they decided to leave to WT implementation. Intel agree with  
Ericsson and Qualcomm.  
- Samsung think this is a guideline as in LAA.  
=> Not pursued
- [R2-162905](#) Co-existence of LWA/LWIP with legacy operator WLAN QUALCOMM CDMA Technologies  
discussion  
- AT+T think this needs to be discussed more.  
- Ericsson don't think there is a problem to address.  
- MediaTek think there may be a problem but as the release is closed we should be careful.  
- BlackBerry thinks it can be discussed in R14.  
- Qualcomm think that the operator wants to use LWA and LWIP in preference over legacy  
offload mechanisms.  
- Broadcom think it may not be a critical issue to address and other solutions can also be  
discussed.  
=> Noted

## Capabilities

- [R2-162174](#) Clarifications on LWA capability HTC Corporation draftCR 36.306 13.1.0- - F  
Rel-13 LTE\_WLAN\_radio-Core  
=> Definition of lwa-BufferSize-r13 can be worked offline  
=> Impact analysis to be added  
=> Check offline whether this should be merged with [R2-162448](#).  
=> Revised in [R2-163092](#)
- [R2-163092](#) Clarifications on LWA capability HTC Corporation draftCR 36.306 13.1.0- - F  
Rel-13 LTE\_WLAN\_radio-Core [R2-162174](#)  
=> Agreed in principle
- [R2-162452](#) Update of WLAN MAC address and supported WLAN bands Intel Corporation discussion  
- Ericsson aks why and when would the UE update the MAC address. It would break if this happened during LWA.  
- Intel think this can happen if WLAN in the phone is turned off and on. Also some APIs can change it on the fly. Also some implementations randomise it for privacy.  
- BlackBerry think the change is very infrequent and usually due to WLAN off/on. Not sure we need to cover this case. MediaTek have a similar view and think it may not require RAN2 solutions.  
- Nokia thinks that for R13 the UE needs to ensure that it keep the MAC address that was given to the eNB. CATT think this case doesn't need to be supported.  
- Broadcom think there can be other cases where this can occur (e.g. WLAN aggregation cases)  
- Samsung thinks it is rare but anyway the UE need to be able to report this to the network. Qualcomm think detach/re-attach is the only option. Ericsson thinks that failure indication can be sent to the eNB.  
=> Noted

## PDCP

- [R2-162177](#) Clarification on LWA HTC Corporation draftCR 36.323 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core  
=> Offline discussion to improve the CR.  
=> Impact analysis needs to be added  
=> Revised in [R2-163099](#)
- [R2-163099](#) Clarification on LWA HTC Corporation draftCR 36.323 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core [R2-162177](#)  
=> Agreed in principle
- [R2-162363](#) Clarification of LWA status report MediaTek Inc. draftCR 36.323 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core  
- Huawei think if all packets were received in order then there are no stored pakcets. MediaTek think that this case is addressed by FMS.  
- Qualcomm agree if there is nothing in the buffer then this is undefined but we want FMS to be reported. MediaTek suggest saying "if no received PDCP PDU is stored"  
=> Wording of te CR can be worked on offline  
=> Editorials to be corrected  
=> Impact analysis to be added.  
=> To be updated to be on the latest version of the spec  
=> Revised in [R2-163100](#)
- [R2-163100](#) Clarification of LWA status report MediaTek Inc. draftCR 36.323 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core [R2-162363](#)  
=> Removed 'such'  
=> Clean up CR to remove unwanted sections  
=> Agreed in principle in [R2-163143](#)
- [R2-162434](#) Polling for LWA status report Huawei, HiSilicon draftCR 36.323 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core  
=> Agreed in principle

## RRC

- [R2-162450](#) Clarification on timeToTrigger for WLAN measurement reporting Intel Corporation discussion
- Ericsson think the 5s is the detection time and not the measurement period.
  - Qualcomm think the TTT is worthless but it is not broken. Samsung think it can be addressed in current spec by setting to 0.
  - Nokia think this can be left to eNB implementation to choose reasonable TTT value. Ericsson agree. CATTthink the TTT is still needed and it is better to define different values. Huawei agree that it is network implementation.
- => Noted
- [R2-162800](#) Configuration of LWA and LWIP upon handover Samsung Telecommunications draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core, LTE\_WLAN\_radio\_legacy-Core
- Huawei think it is not included in the handover as we don't support LWA handover. Qualcomm think this is part of R14 objectives.
  - Samsung clarify that the proposal is not for delta signalling. It is to remove a restriction on signalling that is already present.
- => Offline discussion
- Samsung gave update from offline. CR is now revised in [R2-163025](#)
- [R2-163025](#) Configuration of LWA and LWIP upon handover Samsung Telecommunications draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core, LTE\_WLAN\_radio\_legacy-Core
- => Agreed in principle
- [R2-162153](#) Clarification on LWA HTC Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core
- Ericsson think the first change is not required and not clear. Intel agree the first change is not needed and is already covered in bullet 2.
- => Updated to the latest version of the spec.
- => Include entire sections
- => Details of the changes can be discussed offline.
- => Impact analysis
- => Revision in [R2-163101](#)
- [R2-163101](#) Clarification on LWA HTC Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core [R2-162153](#)
- => Removed the condition "Cond nonHOTOEUTRA" and add text in the handover to E-UTRA procedure text
- => Update can be provided to the next meeting. Postponed
- [R2-162431](#) The granularity of LWAAP entity Huawei, HiSilicon discussion
- => Noted
- [R2-162432](#) The granularity of LWAAP entity Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core
- CATT think the 'part of' wording is not so clear. Suggest "disable the LWAAP entity to handles".
- => Wording can be discussed offline
- => Revision on [R2-163102](#)
- [R2-163102](#) The granularity of LWAAP entity Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core [R2-162432](#)
- Huawei ask if "enable data handling for this DRB" needs to be described in the LWAAP spec.
- => Agreed in principle
- [R2-162674](#) WLAN measurements and User preference NEC discussion
- => Noted
- [R2-162954](#) WLAN measurements and user preference NEC draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core
- for replacing withdrawn CR in [R2-162675](#)

- MediaTek agree with the intention but suggest adding a reference to the SA2 specs where coexistence is described
- TCL assume that the eNB will deconfigure the measurement report and so there is no need for the note.
- Samsung think it is not about triggering but about performing measurements in which case 5.5.3 would be better.

=> Move the note to 5.5.3 and add reference to SA2 specs

=> Revised in [R2-163103](#)

[R2-163103](#) WLAN measurements and user preference NEC draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core [R2-162954](#)  
=> Agreed in principle

[R2-162189](#) Corrections to LWA CATT draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core  
=> Remove bold font from 'is'  
=> Agreed in principle in [R2-163104](#)

[R2-162433](#) Clarification on WLAN measurement Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core  
- Intel think there are other parameters that are not applicable. Maybe they should be added.  
=> Agreed in principle.

[R2-162451](#) Miscellaneous RRC corrections for LWA Intel Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core  
- Note in 5.5.3.2 needs to be updated  
- Qualcomm think the variable is used. Intel explain it is removed where it is set but there was no place where it was used.  
- Samsung think for the autonomous release case it was agreed that UE would wait for the eNB to perform the action to release.  
=> Note in 5.5.3.2 to be updated  
=> Autonomous release action to be removed  
=> Revised in [R2-163106](#)

[R2-163106](#) Miscellaneous RRC corrections for LWA Intel Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core [R2-162451](#)  
=> Agreed in principle

[R2-162437](#) The handling of WLAN status monitoring Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core  
=> Change in 5.6.14.3 to be removed  
=> Agreed in principle in [R2-163107](#)

Moved from 6 to 7.6.1

[R2-162595](#) Coverage extension for LWA and LWIP features TCL Communication Ltd., Sprint draftCR 36.331 13.1.0- - F Rel-13 TEI13  
- Qualcomm think this is not a correction but more an addition of an ANR like feature. Can be discussed as part of R14 ANR additions.  
- Nokia agree it should not be added for R13.  
=> Not pursued

Moved from 7.16 to 7.6.1

**Withdrawn:**

[R2-162307](#) Configuration of LWA and LWIP upon handover Samsung Telecommunications CR 36.331 13.1.02117 - F Rel-13 LTE\_WLAN\_radio-Core, LTE\_WLAN\_radio\_legacy-Core

[R2-162675](#) WLAN measurements and user preference NEC CR 36.331 13.1.02120 - F Rel-13 LTE\_WLAN\_radio-Core

[R2-162908](#) Clarification of WLAN authentication for LWA QUALCOMM CDMA Technologies CR  
36.300 13.3.00866 - F Rel-13 LTE\_WLAN\_radio-Core

## 7.6.2 Interworking Enhancements

### Stage 2 corrections

[R2-162435](#) Remaining issue of WLAN connection status reporting for RCLWI Huawei, HiSilicon discussion

- Ericsson think the original discussion was to not support this but then we agreed to align the mechanism.
- Ericsson think for simplicity we should have one approach for both features. HTC share this view. Nokia share the view of Ericsson.
- Samsung support Huawei's view and want to stay with the original approach. CATT also support Huawei. Qualcomm also support this view.
- Qualcomm explain that stage 3 is current aligned to the agreement that " success indication is not supported for RCLWI."
- Qualcomm asks if eNB really needs to know about this success. Ericsson sees value in 1 procedure from RRC point of view. MediaTek think that for R12 interworking the success was not needed so don't see why it is needed here.

=> RAN2 confirm that " success indication is not supported for RCLWI."  
=> We will align stage 2 to stage 3.

[R2-162436](#) Clarification on WLAN connection status reporting for RCLWI Huawei, HiSilicon draftCR  
36.300 13.3.0- - F Rel-13 LTE\_WLAN\_radio-Core  
=> Agreed in principle.

[R2-162188](#) Correction of RCLWI call flow CATT draftCR 36.300 13.3.0- - F Rel-13  
LTE\_WLAN\_radio-Core  
=> Agreed in principle

### RRC

[R2-162388](#) UE behaviours during state transitions in RCLWI Samsungdiscussion

- Ericsson think we can stick to the current behaviour that the UE keeps the configuration when it moves to connected. Qualcomm think that it can be released.
- Ericsson think use case might be that UE has offloaded internet traffic but the return to connected for a voice call. W want the traffic to remain offloaded. BlackBerry think the traffic should stay on WLAN unless WLAN is broken. If the UE connects to LTE for a different reason from WLAN failure then the traffic should not be brought back to LTE.
- BlackBerry think if the configuration of mobility set is not valid in a new cell then it will fail and the traffic will anyway come back o LTE.
- Ericsson suggest that a bit for network to configure between the 2 different behaviours.

=> Offline discussion (Samsung)  
- Samsung gave update from offline which did not conclude.  
=> Noted

✉ **[93#20][LTE/LWI] State transitions (Samsung)**  
Intended outcome: Email discussion report and potentially draft CR to the next meeting  
Deadline: Thursday 05/05/2016

[R2-162390](#) UE behaviours while configured with steeringCommandWLAN SamsungdraftCR 36.331  
13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core  
Not treated

[R2-162391](#) Steering command during T350 Samsungdiscussion

- Not treated. Discussed based on CR.

[R2-162392](#) Steering command during T350 SamsungdraftCR 36.331 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core  
=> Agreed in principle

[R2-162154](#) Clarification on RCLWI HTC Corporation draftCR 36.331 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core

- Not treated based on outcome of stage 2 CR

[R2-162190](#) Variable Handling for RCLWI CATT draftCR 36.331 13.1.0- - F Rel-13  
LTE\_WLAN\_radio-Core  
=> Agreed in principle

[R2-162799](#) Alignment of RCLWI configuration Samsung Telecommunications draftCR 36.331  
13.1.0- - F Rel-13 LTE\_WLAN\_radio-Core  
=> Agreed in principle

**Withdrawn:**

[R2-162306](#) Alignment of RCLWI configuration Samsung Telecommunications CR 36.331 13.1.0  
2116 - F Rel-13 LTE\_WLAN\_radio-Core

## 7.7 WI: Multicarrier Load Distribution in LTE

(LTE\_MC\_load-Core, leading WG: RAN2, started: Mar. 15, closed: Dec. 15, WID: [RP-152181](#))

[R2-162698](#) Renaming UE\_ID used for MCLD purposes in TS 36.304 Nokia, Alcatel-Lucent Shanghai Bell discussion  
=> Noted

[R2-162697](#) Renaming UE\_ID used for MCLD purposes Nokia, Alcatel-Lucent Shanghai Bell draftCR  
36.304 13.1.0- - F Rel-13 LTE\_MC\_load-Core  
=> Alternative to ue-ID to be found to avoid misinterpretation  
=> Revised in [R2-163110](#)

[R2-163110](#) Renaming UE\_ID used for MCLD purposes Nokia, Alcatel-Lucent Shanghai Bell draftCR  
36.304 13.1.0- - F Rel-13 LTE\_MC\_load-Core [R2-162697](#)  
=> Agreed in principle

[R2-162722](#) Discussion on ambiguity after timer T360 expiry for Idle mode load redistribution Intel Corporation discussion  
=> revised in [R2-162962](#)

[R2-162962](#) Discussion on ambiguity after timer T360 expiry for Idle mode load redistribution Intel Corporation discussion

- Nokia think after T360 expire it is not correct that the UE will start measurement and move to the highest priority. The SIB content can be adjust to prevent the UE from returning the previous highest priority frequency. Intel think there should not have to be coordination between the carriers/
- ZTE think the problem exists but think a solution doesn't need to be specified. A smart UE will do the measurements before T360 expires.
- Samsung ask what was the motivation to go redistribute against the frequency priorities. ZTE explain the intent was to allow redistribution across all carriers not just same priority.

=> RAN2 understanding that in the scenario described the UE should not move to F1 on T360 expiry before redistribution is complete.  
=> Discussion offline to try to find how to capture this in the spec (Intel)  
- Intel gave update from offline. No conclusion was reached.  
=> Postponed to next meeting.

[R2-162734](#) Clarification of timer description for MCLD Kyocera draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_MC\_load-Core  
=> 'performing' in final column should be 'perform'  
=> Discuss offline if the second column ' and upon reselecting a cell not belonging to the redistribution target.' Can be improved.  
=> Revised in [R2-163111](#)

[R2-163111](#) Clarification of timer description for MCLD Kyocera draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_MC\_load-Core [R2-162734](#)  
=> Agreed in principle

## 7.8 WI: Dual Connectivity Enhancements

(LTE\_dualC\_enh-Core; leading WG: RAN2; started: Mar. 15; closed: Dec. 15; WID: [RP-151739](#))

- [R2-162198](#) Clarification on DC HTC Corporation draftCR 36.300 13.3.0- - F Rel-13  
LTE\_dualC\_enh-Core  
=> "when CA or DC are not configured" should be "when neither CA nor DC are configured"  
=> With change above the CR is agreed in principle in [R2-163112](#)

## 7.9 WI: RAN enhancements for extended DRX in LTE

(LTE\_extDRX-Core; leading WG: RAN2; started: Mar. 15; closed: Mar. 16; WID: [RP-150493](#))

### Incoming LS:

- [R2-162127](#) Response LS to S2-153716 on RAN3 feedback on paging coordination in extended idle mode DRX (R3-160566; contact: Nokia Networks) RAN3 LS in  
to: RAN2 Rel-13 LTE\_extDRX-Core  
*moved from 3.2*  
=> Noted

- [R2-162592](#) Correction on SI update for eDRXH Huawei, HiSilicon draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_extDRX-Core  
=> Agreed in principle

- [R2-162806](#) Correction to Paging Window calculation Ericsson discussion
- Intel see the problem but don't think the solution is the best way. Would prefer to work on a solution offline.
  - DOCOMO think the issue should be addressed but we should try to find a solution that only affects RAN2, and not RAN3 or NAS specs. Ericsson solution does this but can consider this.
  - Nokia think it may not be so important to ensure that the number of paging is equal. Huawei agree with Nokia that this is not important.
  - Samsung think this is important to solve but can discuss the solution.
  - Softbank think this is important to solve.
  - Intel think we will need to inform SA2 of whatever we decide to do.
  - Nokia agree this was not the intended behaviour but the cause is that the values defined in RAN3 were not well chosen. Ericsson think the issue is not that the window is defined in seconds but that the window doesn't start at a paging occasion.
- => We will try to fix the issue identified in the paper
- ☒ **[93#06][LTE/eDRX/NB-IOT] eDRX paging solution (Ericsson)**  
To find solution to the problem identified in [R2-162806](#) and potentially discuss other issues identified  
Intended outcome: Email discussion report and draft CR  
Deadline: Thursday 05/05/2016

- [R2-162807](#) Correction to Paging Window calculation Ericsson draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_extDRX-Core  
Not treated

## 7.10 WI: Elevation Beamforming/Full-Dimension (FD) MIMO for LTE

(LTE\_EBF\_FDMIMO-Core; leading WG: RAN1; started: June. 15; closed: Dec. 15; WID: [RP-151085](#))

Including output of email discussion [93#46][LTE/MIMO] 36.331 CR on capabilities (Samsung)

### Incoming LS:

- [R2-162106](#) LS on EB/FD-MIMO Terminologies ([R1-161336](#); contact: Samsung) RAN1 LS in  
to: RAN2 Rel-13 LTE\_EBF\_FDMIMO-Core
- Already taken into account in our specs
- => Noted

- [R2-162107](#) LS on EBF/FD-MIMO related RAN1 agreements ([R1-161512](#); contact: CATT) RAN1 LS in to: RAN2 Rel-13 LTE\_EBF\_FDMIMO-Core  
- Already taken into account in our specs  
=> Noted
- [R2-162148](#) LS on signalling of periodic CSI reporting for class A (R1-163668; contact: Samsung) RAN1 LS into: RAN2 Rel-13 LTE\_EBF\_FDMIMO-Core  
late  
- new incoming LS  
=> A CR to address this can be submitted to the next meeting  
=> Noted

*Above 3 LSs moved from 3.2*

**Output of email discussion [93#46][LTE/MIMO]:**

- [R2-162796](#) Introducing EBF/FD-MIMO capabilities Samsung Telecommunications draftCR 36.331  
13.1.0- - F Rel-13 LTE\_EBF\_FDMIMO-Core [RP-160520](#)  
Revised in [R2-163105](#)
- [R2-163105](#) Introducing EBF/FD-MIMO capabilities Samsung Telecommunications draftCR 36.331  
13.1.0- - F Rel-13 LTE\_EBF\_FDMIMO-Core [RP-160520](#)  
- Qualcomm would like to have some more time for checking  
=> Comeback after offline checking
- [R2-163131](#) Introducing EBF/FD-MIMO capabilities Samsung Telecommunications draftCR 36.331  
13.1.0- - F Rel-13 LTE\_EBF\_FDMIMO-Core [RP-160520](#)  
- DOCOMO think this is related to the CA capabilities. Does this mean that we concluded not to use the choice between the legacy and reduced format.  
=> Agreed in principle
- [R2-162797](#) Introducing EBF/FD-MIMO capabilities Samsung Telecommunications draftCR 36.306  
13.1.0- - F Rel-13 LTE\_EBF\_FDMIMO-Core  
- One minor comment to be fixed  
- DOCOMO suggest adding references to RAN1 specifications.  
=> Revised in [R2-163115](#)
- [R2-163115](#) Introducing EBF/FD-MIMO capabilities Samsung Telecommunications draftCR 36.306  
13.1.0- - F Rel-13 LTE\_EBF\_FDMIMO-Core [R2-162797](#)  
=> Agreed in principle
- [R2-162676](#) Support of CRI reporting in MAC ETRI discussion  
=> Noted
- [R2-162688](#) Corrections on Support of CRI reporting in MAC ETRI draftCR 36.321 13.1.0- - F  
Rel-13 LTE\_EBF\_FDMIMO  
=> Impact analysis to be added  
=> Agreed in principle in [R2-163113](#)
- [R2-162853](#) Correction to FD-MIMO field descriptions Ericsson draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_EBF\_FDMIMO-Core  
- Some minor comments to be addressed  
=> Revision in [R2-162980](#)
- [R2-162980](#) Correction to FD-MIMO field descriptions Ericsson draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_EBF\_FDMIMO-Core [R2-162853](#)  
=> Revised in [R2-163114](#)
- [R2-163114](#) Correction to FD-MIMO field descriptions Ericsson draftCR 36.331 13.1.0- - F  
Rel-13 LTE\_EBF\_FDMIMO-Core [R2-162980](#)  
=> Agreed in principle

**Withdrawn:**

- [R2-162302](#) Introducing EBF/FD-MIMO capabilities Samsung Telecommunications CR 36.331  
13.1.02114 - F Rel-13 LTE\_EBF\_FDMIMO-Core
- [R2-162303](#) Introducing EBF/FD-MIMO capabilities Samsung Telecommunications CR 36.306  
13.1.00356 - F Rel-13 LTE\_EBF\_FDMIMO-Core

## 7.11 WI: Further Enhancements of Minimization of Drive Tests for E-UTRAN

(LTE\_eMDT2-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: [RP-151611](#))

No contribution received.

## 7.12 WI: Indoor Positioning Enhancements for UTRA and LTE

(UTRA\_LTE\_iPos\_enh-Core; leading WG: RAN2; started: Sep. 15; closed: Dec 15; WID: [RP-152251](#))

No contribution received.

## 7.13 WI: LTE-WLAN RAN Level Integration supporting legacy WLAN

(LTE\_WLAN\_radio\_legacy-Core; leading WG: RAN2; started: Sep. 15; closed: Mar 15; WID: [RP-151615](#))

### Incoming LS:

[R2-162113](#) Response LS to S3-160274 = [R2-161047](#) on LWIP Solution and DRB distinction (R3-160533; contact: Nokia Networks) RAN3 LS in cc: RAN2 Rel-13 LTE\_WLAN\_radio\_legacy-Core *moved from 3.2*  
=> Noted

[R2-162178](#) Clarification on LWIP configuration HTC Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio\_legacy-Core  
=> Comeback  
=> An update will be provided in a contribution submitted at the next meeting. Postponed.

[R2-162492](#) Small corrections to LWIP Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331 13.1.0- - F Rel-13 LTE\_WLAN\_radio\_legacy-Core  
=> Agreed in principle in [R2-163116](#)

## 7.14 WI: Narrowband IOT

(NB\_IOT-Core; leading WG: RAN1; started: Sep. 15; target: Jun. 16; WID: [RP-152284](#))

Time budget: N/A

Documents in this agenda item handled in the NB-IoT Break Out session. Please see Annex I

### 7.14.1 General

Organization, Requirements, Overall CP/UP aspects

Including output of email discussion [93#24][LTE/NB-IOT] Response LS to SA2 (Vodafone)

### Incoming LS:

[R2-162103](#) Reply LS to [R2-160405](#) on per-UE configuration to allow exception reporting (C1-161430; contact: Qualcomm) CT1 LS in to: RAN2 Rel-13 CIOT-CT

[R2-162104](#) Existence of CIoT support and NAS protocol details for CIoT (C1-161544; contact: Huawei) CT1 LS in to: RAN2 Rel-13 CIOT-CT [R2-162111](#) LS on physical-layer aspects of NB-SIB1 transmission ([R1-161566](#); contact: Huawei) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core

[R2-162117](#) Reply LS to S3-160337 = [R2-161048](#) on Clarifications on RRC Resume Request (S2-161260; contact: Qualcomm) SA2 LS in cc: RAN2 Rel-13 NB\_IoT-Core

[R2-162118](#) Reply LS to C1-161430 = [R2-162103](#) on NB-IoT work progress in RAN2 (S2-161331; contact: Qualcomm) SA2 LS in to: RAN2 Rel-13 NB\_IoT-Core, CIOT-CT

[R2-162119](#) Reply LS to R3-160135 = [R2-161014](#) on questions on NB-IoT (S2-161333; contact: Vodafone) SA2 LS in to: RAN2 Rel-13 NB\_IoT-Core, CIoT

- [R2-162120](#) Reply LS to R3-160147= [R2-161017](#) on CIOT optimization (S2-161344; contact: Samsung) SA2 LS in to: RAN2 Rel-13 NB\_IoT-Core
- [R2-162121](#) Reply LS to S3-161544 on Existence of CloT support and NAS protocol details for CloT (S2-161345; contact: Huawei) SA2 LS in to: RAN2 Rel-13 CloT
- [R2-162122](#) Response LS to [R2-162018](#) on CloT optimization for non-NB-IoT Ues (S2-161352; contact: Nokia Networks) SA2 LS in to: RAN2 Rel-13 TEI13, CloT, NB\_IoT-Core
- [R2-162124](#) LS of RRC parameter list for NB-IoT ([R1-161446](#); contact: Huawei) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core
- [R2-162126](#) Reply LS to [R2-161885](#) on TS 36.300 section 5 for NB-IoT ([R1-161555](#); contact: Huawei) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core
- [R2-162128](#) Reply LS to [R2-161948](#) on paging in NB-IoT (S2-161330; contact: Ericsson) SA2 LS in to: RAN2 Rel-13 NB\_IoT-Core
- [R2-162103](#) Reply LS to [R2-160405](#) on per-UE configuration to allow exception reporting (C1-161430; contact: Qualcomm) CT1 LS in to: RAN2 Rel-13 CIOT-CT
- [R2-162104](#) Existence of CloT support and NAS protocol details for CloT (C1-161544; contact: Huawei) CT1 LS in to: RAN2 Rel-13 CIOT-CT
- [R2-162121](#) Reply LS to S3-161544 on Existence of CloT support and NAS protocol details for CloT (S2-161345; contact: Huawei) SA2 LS in to: RAN2 Rel-13 CloT
- [R2-162138](#) LS on RRC parameter list for NB-IoT (R1-162070; contact: Huawei) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core late

Above 13 LSs moved from 3.2

#### **Output of email discussion [93#24][LTE/NB-IOT]:**

- [R2-162574](#) Response to LS on questions on CloT Vodafone GmbH LS out  
*moved from AI 16*
- Intel prefer to respond to Q10 by just saying we have not discussed.
  - MediaTek think that we can send an LS now and then send updates at the end of this meeting.
  - Qualcomm think we have not discussed all the different CIOT optimisations that the eNB might need to be aware of.
- => Respond to question 10 with " Even, RAN WG2 has not discussed this issue in details. RAN2 will discuss signalling to ensure that the eNB can route the connection to an appropriate MME. Details of the solution are FFS in RAN2."
- => Add that we will send an LS with additional updates this week.
- => Add action ("to take the responses into account") and next meeting.
- => Revised in [R2-163060](#)
- [R2-163060](#) Response to LS on questions on CloT Vodafone GmbH LS out  
Rel-13 CloT [R2-162574](#) [R2-163064](#)
- ✓ => LS in [R2-163064](#) is approved
- [R2-162310](#) 36.300 Running CR to Implement Stage 2 Agreements on NB-IoT Huawei draftCR 36.300  
13.3.0- - B Rel-14 NB\_IOT-Core
- [R2-162311](#) 36.302 Running CR to Capture Agreements on NB-IoT Huawei draftCR 36.302 13.1.0-  
- B Rel-14 NB\_IOT-Core
- [R2-162312](#) UE Capabilities Reporting Huawei, HiSilicon, Neul discussion
- [R2-162313](#) Discussion on the Impacts of AS Timers Extension Huawei, HiSilicon, Neul discussion
- [R2-162600](#) Open issues of CloT/NB-IoT CATT discussion
- [R2-162685](#) Multiple DRBs in NB-IoT Ericsson, Vodafone, NTT DOCOMO discussion
- [R2-162723](#) Maximum SDU size QUALCOMM INCORPORATED discussion
- [R2-162725](#) Simultaneous support for CP and UP optimisations QUALCOMM INCORPORATED discussion

## **7.14.2 Control Plane**

### **7.14.2.1 Radio Resource Control - RRC**

Including output of email discussion [93#40][NB-IOT] NB-IOT ASN.1 structure (Huawei)

Including output of email discussion [93#41][NB-IOT] Resume operation (Ericsson)

Including output of email discussion [93#42][NB-IOT] Access Control (LG)

Including output of email discussion [93#43][NB-IOT] CP solution (Huawei)

## ASN.1

- [R2-162317](#) Email Discussion Report on [93#40][NB-IOT] ASN.1 Structure Huawei report
- Samsung ask of this implies a different logical channel. Huawei respond that the message class is named differently but it doesn't imply a different logical channel. Samsung think that for a dual mode device it may have to receive messages from one logical channel that are encoded according to different message classes.
- => Noted
- [R2-162318](#) ASN.1 Structure Using Multiple Modules Huawei discussion
- [R2-162493](#) RRC structure for NB-IOT Nokia, Alcatel-Lucent Shanghai Bell discussion
- Above 2 contributions discussed jointly
- MediaTek suggest we need to look at what problems we are trying to solve. Why are we not considering the simple solution of just branching in the way we do today for any new feature. Another simple approach would be to define completely separate modules. Don't understand why we need to compile a joint version.
  - Huawei explain the joint compilation requirement has been strongly expressed by several network vendors. 2 separate modules with common IEs being duplicated has a risk that we will diverge some day. Prefer to re-use code if possible.
  - Intel think that the separate freeze for NB-IOT and LTE is an exception for R13 and we should not do the same again in future releases. Hence don't see a big issue over ASN.1 freezing.
  - Intel prefer to 2 module approach, at least as a starting point. Nokia support starting with 2 module approach.
  - MediaTek think the common IEs need to be identified in some way even in the 2 module approach but agree 2 module is a better starting point.
  - Samsung think the common IEs are all in the imports and so clearly identified.
  - Ericsson also support 2 module approach.
  - Samsung think that an NB-IOT IE could be moved to LTE in future if it was found necessary to use in LTE as well in future.
  - MediaTek assume that CIOT parts will go in LTE module.
- => 2 module approach will be used
- => 1 module is for LTE and some part of this are also used by NB-IOT (this will include CIOT parts). IEs that are used by NB-IOT will have a comment to identify them.
- => 2nd module is for NB-IOT specific parts
- => Only import from LTE to NB-IOT module (and not in other direction)
- [R2-162506](#) Report of the email discussion [93#41][NB-IOT] Resume operation Ericsson report
- [R2-162948](#) Email Report of [93#42][NB-IOT] Access Control LG Electronics Inc. report
- late
- [R2-162320](#) Report of the email discussion [93#43][NB-IOT] CP Solution Huawei report
- [R2-162314](#) 36.331 Running CR to Capture Agreements on NB-IoT Huawei draftCR 36.331 13.1.0-  
- B Rel-13 NB\_IOT-Core
- [R2-162315](#) 36.331 Running CR including ASN.1 Huawei draftCR 36.331 13.1.0- - B Rel-13  
NB\_IOT-Core
- [R2-162316](#) 36.331 Running CR Implementation Huawei, HiSilicon, Neul discussion
- [R2-162319](#) Report of the unofficial email discussion on ASN.1 for dedicated radio resource configuration  
Huawei discussion
- late
- [R2-162321](#) RRC Remaining Issues Huawei, HiSilicon, Neul discussion
- [R2-162322](#) PHY Configuration - ASN.1 aspects Huawei, HiSilicon, Neul discussion
- late
- [R2-162323](#) Radio Link Failure Huawei, HiSilicon, Neul discussion
- [R2-162324](#) Terminology for NB-IoT Solution 18 Huawei, HiSilicon, Neul discussion
- [R2-162355](#) Msg3 in NB-IoT ZTE discussion
- [R2-162356](#) Remaining issues for UP solution ZTE discussion

|                           |                                                                                                                                    |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">R2-162357</a> | Considerations on cloT indications in NB-IoT ZTE discussion                                                                        |
| <a href="#">R2-162483</a> | Discussion on dedicated SR for NB-IoT NTT DOCOMO INC. discussion                                                                   |
| <a href="#">R2-162485</a> | UP modelling for U-plane solution NTT DOCOMO INC. discussion                                                                       |
| <a href="#">R2-162543</a> | CloT indications in SIB and msg.5 during attach procedure for NB-IOT Intel Corporation discussion                                  |
| <a href="#">R2-162545</a> | RAN impacts of CloT CP and UP solution for NB-IOT Intel Corporation discussion                                                     |
| <a href="#">R2-162550</a> | Remaining aspects of message 3 for NB-IoT Intel Corporation discussion                                                             |
| <a href="#">R2-162552</a> | Open aspects of UP solution for NB-IoT Intel Corporation discussion                                                                |
| <a href="#">R2-162554</a> | Need of NAS recovery and RLF/RLM triggering Intel Corporation discussion                                                           |
| <a href="#">R2-162557</a> | Response to SA2 on RRC establishment cause Intel Corporation discussion                                                            |
| <a href="#">R2-162559</a> | Bearer id list in Resume message 3 for NB-IoT Intel Corporation discussion                                                         |
| <a href="#">R2-162596</a> | Further discussion on NB-IoT resume failure HTC Corporation discussion                                                             |
| <a href="#">R2-162597</a> | Discussion on RRC connection setup handling in RRC connection resume procedure HTC Corporation discussion                          |
| <a href="#">R2-162598</a> | Consideration on open issues of resumption CATT discussion                                                                         |
| <a href="#">R2-162599</a> | How to construct the volume indication CATT discussion                                                                             |
| <a href="#">R2-162634</a> | Considerations on Resume ID Sony discussion                                                                                        |
| <a href="#">R2-162644</a> | NB-IoT – Further details on RRC suspend and resume Nokia, Alcatel-Lucent Shanghai Bell discussion                                  |
| <a href="#">R2-162645</a> | Solution preference and data volume indications for NB-IoT Nokia, Alcatel-Lucent Shanghai Bell discussion                          |
| <a href="#">R2-162658</a> | Issues Related to Non- anchor PRB SHARP Corporation discussion                                                                     |
| <a href="#">R2-162659</a> | NAS Recovery for NB-IoT UE NTT DOCOMO INC. discussion                                                                              |
| <a href="#">R2-162661</a> | Necessary IEs in message 3 NTT DOCOMO INC. discussion                                                                              |
| <a href="#">R2-162679</a> | UE capabilities Ericsson discussion                                                                                                |
| <a href="#">R2-162680</a> | Introduction of NB-IoT UE capabilities Ericsson draftCR 36.306 13.1.0- - B Rel-13 NB_IOT-Core late                                 |
| <a href="#">R2-162681</a> | Access Barring Ericsson discussion                                                                                                 |
| <a href="#">R2-162682</a> | Access Barring Ericsson draftCR 36.331 13.1.0- - B Rel-13 NB_IOT-Core                                                              |
| <a href="#">R2-162683</a> | Establishment causes for NB-IoT Ericsson discussion                                                                                |
| <a href="#">R2-162692</a> | Draft CR to capture outcome of mail discussion on RRC Resume operation Ericsson draftCR 36.331 13.1.0- - B Rel-13 NB_IOT-Core late |
| <a href="#">R2-162736</a> | Early RRC Connection Release for UP solution Sequans Communications discussion                                                     |
| <a href="#">R2-162769</a> | UE Reconfiguration to a Non-Anchor Carrier in NB-IoT Ericsson discussion                                                           |
| <a href="#">R2-162828</a> | RRC Connection Release for CP solution Sequans Communications discussion                                                           |
| <a href="#">R2-162829</a> | Autonomous RRC Connection Release Sequans Communications discussion                                                                |
| <a href="#">R2-162856</a> | Introducing SRB3 for NB-IOT LG Electronics Inc. discussion                                                                         |
| <a href="#">R2-162857</a> | Need for PDCP TM in NB-IOT LG Electronics Inc. discussion                                                                          |
| <a href="#">R2-162865</a> | RRC Resume AS-NAS interaction Ericsson discussion                                                                                  |
| <a href="#">R2-162866</a> | Security aspects of NB-IoT Ericsson discussion                                                                                     |
| <a href="#">R2-162867</a> | Further aspects of RRC Resume and Resume Id Ericsson discussion                                                                    |
| <a href="#">R2-162871</a> | Release Cause Indication at RLF LG Electronics France discussion                                                                   |
| <a href="#">R2-162880</a> | NB-IOT – Remaining RRC Issues MediaTek Inc. discussion                                                                             |
| <a href="#">R2-162886</a> | Simultaneous support of CP and UP solutions NEC discussion                                                                         |
| <a href="#">R2-162887</a> | Procedure for mo-Signaling after RRC suspended NEC discussion                                                                      |
| <a href="#">R2-162900</a> | Data Volume Indicator for NB-IOT LG Electronics Inc. discussion                                                                    |
| <a href="#">R2-162918</a> | Data Volume Indication Mechanism in NB-IoT Samsung Electronics discussion late                                                     |
| <a href="#">R2-162921</a> | Data Volume Indication Mechanism in NB-IoT Samsung Electronics discussion                                                          |
| <a href="#">R2-162937</a> | Access Barring Alleviation for NB-IOT LG Electronics Inc. discussion                                                               |
| <a href="#">R2-162938</a> | The reject procedure of RRC connection resume request in solution 18 LG Electronics Inc. discussion                                |
| <a href="#">R2-162939</a> | UE internal NAS-AS interaction to perform RRC connection resume procedure LG Electronics Inc. discussion                           |
| <a href="#">R2-162950</a> | Proposed CR to 36.331 on NB-IOT access control LG Electronics Inc. draftCR 36.331 13.1.0- - B Rel-13 NB_IOT-Core late              |
| <a href="#">R2-162968</a> | Comments on 36.331 Running CR to capture agreements on NB-IoT Ericsson discussion late                                             |

[R2-162969](#) 36.331 CR to capture introduction of NB-IoT Ericsson draftCR 36.331 13.1.0- - B  
Rel-13 NB\_IOT-Core  
late

### 7.14.2.2 System Information

[R2-162325](#) System Information Scheduling and Update Huawei, HiSilicon, Neul discussion  
[R2-162326](#) System Information Content Huawei, HiSilicon, Neul discussion  
=> revised in [R2-162973](#)  
[R2-162973](#) System Information Content Huawei, HiSilicon, Neul discussion  
[R2-162358](#) Considerations on system information change notification ZTE discussion  
[R2-162724](#) NB-IoT Master Information Block content QUALCOMM UK INCORPORATED discussion  
=> revised in [R2-162966](#)  
[R2-162966](#) NB-IoT Master Information Block content QUALCOMM UK INCORPORATED discussion  
[R2-162770](#) System Information Update for NB-IoT Ericsson discussion  
[R2-162771](#) MIB Contents for NB-IoT Ericsson discussion

### 7.14.2.3 Idle mode procedures

Including output of email discussion [93#44][NB-IOT] Cell reselection and load distribution (Ericsson)

[R2-162687](#) Summary of email discussion [93#44] [NB-IOT] Cell reselection and load Ericsson discussion  
[R2-162329](#) Report of the Email Discussion on Idle Mode Mobility and Paging Huawei discussion  
late  
[R2-162201](#) Measurement considerations for NB-IoT Gemalto N.V. discussion  
[R2-162202](#) Mobility considerations for NB-IoT Gemalto N.V. discussion  
[R2-162327](#) Handling of IFRI for NB-IoT Huawei, HiSilicon, Neul discussion  
[R2-162328](#) Idle Mode Mobility Huawei, HiSilicon, Neul discussion  
[R2-162555](#) Load balancing in NB-IOT Intel Corporation discussion  
[R2-162646](#) 36.304 running CR to capture agreements on NB-IoT Nokia draftCR 36.304 13.1.0- - B  
Rel-13 NB\_IOT-Core  
[R2-162684](#) Idle mode mobility Ericsson discussion  
[R2-162869](#) Measurement Rules for Cell Reselection for NB-IoT LG Electronics France discussion  
[R2-162882](#) NB-IOT – Remaining Issues on Idle-mode Procedures and Paging MediaTek Inc. discussion  
[R2-162919](#) Discussion on remaining idle mode issues in NB-IoT Samsung Electronics discussion

### 7.14.2.4 Paging

[R2-162330](#) Remaining Open Issues on Paging in NB-IoT Huawei, HiSilicon, Neul discussion  
[R2-162359](#) Remaining issues for Paging in NB-IoT ZTE discussion  
[R2-162686](#) Paging and (e)DRX Ericsson discussion

## 7.14.3 User Plane

### 7.14.3.1 MAC/RLC

[R2-162331](#) Random Access Procedure Huawei, HiSilicon, Neul discussion  
[R2-162332](#) DRX in Connected Mode Huawei, HiSilicon, Neul discussion  
[R2-162333](#) RLC Remaining Issues Huawei, HiSilicon, Neul discussion  
[R2-162334](#) RLC and PDCP Discard Huawei, HiSilicon, Neul discussion  
[R2-162335](#) HARQ Configuration Huawei, HiSilicon, Neul discussion  
[R2-162360](#) Further analysis on preamble transmission in NB-IoT ZTE discussion  
[R2-162547](#) Further discussion on RLC-AM for NB-IOT Intel Corporation discussion  
[R2-162614](#) Updated RLC running CR for NB-IoT NTT DOCOMO INC. draftCR 36.322 13.1.0- - B  
Rel-13 NB\_IOT-Core  
[R2-162617](#) Support of different Msg.3 TBS for NB-IoT UEs NTT DOCOMO, INC. discussion  
[R2-162639](#) NB-IoT – Further details on RA procedure for supporting multiple PRBs Nokia, Alcatel-Lucent  
Shanghai Bell discussion

- [R2-162640](#) SR procedure for NB-IoT Nokia, Alcatel-Lucent Shanghai Bell discussion  
[R2-162772](#) MAC aspects on DVI, BSR, PHR, etc for NB-IoT Ericsson discussion  
[R2-162773](#) Remaining issues on Scheduling and HARQ for NB-IoT Ericsson discussion  
[R2-162774](#) Use of preambleTransMax for NB-IoT Ericsson discussion  
[R2-162775](#) The usage of t-Reordering for NB-IoT Ericsson discussion
- [R2-162777](#) Email discussion report on MAC open issues for NB-IoT Ericsson discussion late
- [R2-162778](#) 36.321 running CR to capture agreements on NB-IoT Ericsson draftCR 36.321 13.1.0- - B Rel-13 NB\_IOT-Core late

### 7.14.3.2 PDCP

- [R2-162548](#) PDCP transparent mode for NB-IoT with CIoT CP solution Intel Corporation discussion  
[R2-162638](#) PDCP functionalities for NB-IoT solutions Nokia, Alcatel-Lucent Shanghai Bell discussion  
[R2-162732](#) Introduction of NB-IoT functionality to PDCP protocol Qualcomm Incorporated (Rapporteur) draftCR 36.323 13.1.0- - B Rel-13 NB\_IOT-Core [R2-162074](#)  
[R2-162776](#) RoHC for NB-IoT Ericsson discussion

## 7.15 Other LTE Rel-13 WIs

- [R2-162426](#) Correction on keeping SCG upon inter eNB handover Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_dualC\_ext-Core  
- Qualcomm do not think this is needed and would like to do more checking  
=> Discussion offline  
=> Agreed in principle
- [R2-162678](#) UL UE Categories support for 64 QAM Nokia, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, INC. draftCR 36.331 13.1.0- - F Rel-13 LTE\_UL64QAM  
=> Agreed in principle
- [R2-162971](#) Support of CRS-Assistance signaling for the DL Control Channel IM Intel Corporation draftCR 36.331 13.1.0- - C Rel-13 LTE\_IM\_DLCCH late  
- DOCOMO ask if it is clear what 'DL control channel demodulation' means. Intel will check with RAN4.  
=> Comeback after offline checking  
- Intel gave update from offline discussion. It was clarified that RAN4 understand that 'DL control channel demodulation' is well defined in RAN4.  
=> Agreed in principle

## 7.16 LTE TEI13 enhancements

Small Technical Enhancements affecting LTE Rel-13 that do not belong to any Rel-13 WI.

Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

Only contributions related to already submitted proposals will be treated under TEI13 (e.g. CIoT optimisations for non-NB-IoT UEs, Control of Unattended/Background Traffic)

### CIoT optimisations

#### CIoT - Msg3 and Resume ID

- [R2-162269](#) Resume ID for non-NB-IoT UEs Huawei, HiSilicon discussion  
- ZTE suggest that PRACH partition can be used to indicate the msg3 size. Huawei think this would not be a good solution due to impact of legacy UEs.  
- Samsung think we can't have a complex solution and must keep the 56bits size. Samsung suggest that the suspend message should only be 25 bits and then the UE would provide 25 bits.

- Intel ask if the assumption is that 25 bits is sufficient to identify the context. Ericsson think this is up to network deployment.
- DOCOMO think we can't extend msg3 and so we don't need 2 choices. So the remaining bits can be provided in msg 5.
- Ericsson think it should be allowed to have a larger msg 3 size.
- Qualcomm prefer to keep the 56bits in msg3 and then send the remaining bits in msg 5. Ericsson think the truncation is a simpler approach. Nokia agree with Qualcomm.
- Vodafone does see how this works if the resume id is sent in 2 parts. Intel think is msg5 is used then the 2 extra messages reduces the benefit.

#### Agreement

- 1 We will enable the existing msg3 size (CCCH TBS size 56bits) to be used.
- 2 Resume ID for non-NB-IOT is 40bits

#### Options:

- 2b Truncated Resume ID in msg 3 and Remainder in (a new/different) msg5 if needed
  - 2c Truncated Resume ID or Full Resume ID in msg 3 (e.g indicated in SIB)
  - 2d Full Resume ID in msg 3 and PRACH partitioning used to differentiate new and legacy UEs
- => Offline discussion of the options above(Ericsson)
- Ericsson gave update of offline. Conclusion is to have 2c (i.e, SIB control) with 2d (legacy PRACH partition). Whether PRACH partition need extension can be discussed at the next meeting.
  - Intel understand that the 2d would only be used for LTE and not eMTC
- => Introduce 2c ("Truncated Resume ID or Full Resume ID in msg 3 (e.g indicated in SIB)")
- => The legacy PRACH partition could be used in combination with 2c. Whether the current PRACH partition mechanism needs extension can be discussed at the next meeting.

[R2-162845](#)

RRC Resume ID for non-NB-UEs Ericsson discussion

[R2-162274](#)

Message 3 design of U-plane solution for non-NB-IoT UEs NTT DOCOMO, INC. discussion

[R2-162355](#)

Msg3 in NB-IoT ZTE discussion

NOTE: Tdoc also allocated under 7.14.2.1

[R2-162233](#)

Discussion on Resume Request message Samsung Electronics Co., Ltd discussion

[R2-162234](#)

[Draft] LS on Short MAC-I for RETRIEVE REQUEST message Samsung Electronics Co., Ltd  
LS out Rel-13 TEI13

[R2-162551](#)

Discussion on Msg. 3 for LTE with CIoT solutions Intel Corporation discussion

[R2-162634](#)

Considerations on Resume ID Sony discussion

NOTE: Tdoc also allocated under 7.14.2.1

Above 7 Tdocs not treated

#### CIoT - other topics

[R2-162361](#)

Considerations on cIoT optimization for non-NB-IoT ZTE discussion

P2

- Intel think it is worth to use the PDCP TM solution in non-NB-IOT as it has been defined in NB-IOT. We also think it could be up to the network to support it. Ericsson think that it would be simpler not to use this for non-NB-IOT. Huawei support Intel as it would like a common solution. ZTE think that the NB-IOT solution can't be used directly in LTE. Vodafone support ZTE. Qualcomm don't see the need for this in LTE. LG agree with Qualcomm. Samsung also agree with Qualcomm.
- MediaTek think the NB-IOT solution can be used also for LTE but think it is mainly for the CP solution. Intel see these optimisation as useful for MTC.

P3

- Ericsson would prefer the indication in msg3 if possible. ZTE think there is no room in message 3.

P5

- DOCOMO gave summary of offline on establishment causes. No consensus in offline on the need for mo-Exception-Data.
- LG do not support adding this cause. There are other causes that can be used. Huawei have the same view as LG. Qualcomm also don't see the need for exception data as it will complicate NAS. Vodafone have the same view. KDDI think it is hard to discuss this for non-NB-IOT.

- DOCOMO think that the usage of an a single application used on NB-IOT and non-NB-IOT UEs will nto be possible without the mo-exception data.

#### Agreements

- 1: PDCP transparent mode is not applicable for non NB-IoT capable of cloT optimization.
- 2: For selection of MME, support for CP solution, UP solution, Attach without PDN (indication from NAS) will be indicated in msg5.
- 3: The eNB broadcasts support of CP (provided to NAS), UP mode, Attach without PDN (provided to NAS) in SIB.
- 4: Non-NB-IOT will continue to use the existing establishment causes.

#### ☒ **[93#30][LTE/CIOT opt] Stage 3 CR (Ericsson)**

Intended outcome: Draft CR to next meeting and identification of any remaining issues for discussion. Details of the CR should be based on the NB-IOT CRs.

Deadline: Thursday 12/05/2016

- [R2-162544](#) CloT indications in SIB and msg.5 during attach procedure for LTE Intel Corporation discussion
- [R2-162417](#) Discussion on stage 3 issues of solution 2 Samsung Electronics Co., Ltd discussion
- [R2-162546](#) RAN impacts of CloT CP and UP solution for LTE Intel Corporation discussion
- [R2-162846](#) AS context caching solution (RRC Resume) for non-NB-IoT UEs Ericsson discussion
- [R2-162830](#) Early RRC Connection Release for CloT traffic support Sequans Communications discussion
- [R2-162888](#) Simultaneous support of CP and UP solutions by non-NB-IoT NEC discussion
- Above 6 Tdocs not treated

#### **CloT - stage 3 CRs**

- [R2-162605](#) RRC protocol extension for non-NB-IoT UEs supporting U-plane based solution with AS information stored in RAN NTT DOCOMO, INC. draftCR 36.331 13.1.0- - B Rel-13 TEI13
- [R2-162606](#) LCID assignment for non-NB-IoT UEs to indicate support of S1-based architecture enhancements NTT DOCOMO, INC. draftCR 36.321 13.1.0- - B Rel-13 TEI13
- [R2-162832](#) Introduction of Release Indication PDCP Control PDU Sequans Communications draftCR 36.323 13.1.0- - B Rel-13 TEI13
- [R2-162834](#) Introduction of RRC Connection Release Request Sequans Communications draftCR 36.331 13.1.0- - B Rel-13 TEI13
- Above 4 Tdocs not treated

#### **CloT - other**

- [R2-162268](#) Terminology for NB-IoT solution 18 Huawei, HiSilicon discussion
- [R2-162558](#) Bearer id list in Resume message 3 for LTE Intel Corporation discussion
- [R2-162578](#) UP modelling for U-plane solution NTT DOCOMO INC. discussion
- [R2-162549](#) PDCP transparent mode for LTE with CloT CP solution Intel Corporation discussion
- [R2-162553](#) Support of CloT UP solution for LTE Intel Corporation discussion
- Above 5 Tdocs not treated

#### **Unattended/Background Traffic**

- [R2-162788](#) Options for handling unattended data traffic Huawei, ZTE discussion
- Intel think it is not clear why EAB approach is preferable to the flag provided to the OS approach. It seems that every packet needs to have an unattended flag provided to the NAS. Huawei think this only needs to be provided at connection setup. Huawei thinks the original problem was related to RACH overload and so we should focus on establishment of the connection rather than controlling ongoing flows. This approach also gives more control within 3GPP.
  - Samsung think we should not restrict the possiblity to independently control EAB and unattended traffic.

- Ericsson think that that it is not so much for RAN2 to analyse the differences between the original approach.
  - MediaTek think that most UEs support some sort of background traffic control and is simpler just to provide something to OS to solve the problem.
  - Intel think from RAN2 perspective we can not agree the EAB solution without CT1. We could send an LS to CT1 to inform them of our discussion and then let CT1 discuss whether they could consider this NAS based approach. Also understand that this was not submitted to CT1.
  - CATT support MediaTek's view. The EAB solution can't be applied in connected mode.
  - Samsung is not a supporter of either approach but if it has to choose it would prefer the original proposed solution. BlackBerry have a similar view as Samsung, and there is a reliance on OS in both cases but we need to understand if either approach resolves the original solution.
  - Ericsson don't see that the Huawei solution is more testable.
- => Noted

[R2-162835](#) Access Restriction for Unattended Data Traffic Verizon, Ericsson, Qualcomm draftCR  
36.331 13.1.0- - C Rel-13 TEI13

=> Revised in [R2-162979](#)

[R2-162979](#) Access Restriction for Unattended Data Traffic Verizon, Ericsson, Qualcomm draftCR  
36.331 13.1.0- - C Rel-13 TEI13 [R2-162835](#)

- Apple do not want to see an OS behaviour specified.
- BlackBerry would like to hear from other operators how they might use this. Want operators to use this in the same way.

=> Revised in [R2-163120](#)

[R2-163120](#) Access Restriction for Unattended Data Traffic Verizon, Ericsson, Qualcomm draftCR  
36.331 13.1.0- - C Rel-13 TEI13 [R2-162979](#)

- DT see concerns about the consistent behaviour of UEs from different networks.
  - Vodafone think this is a useful feature.
  - Apple think this is the minimum that is acceptable and anything specifying upper layers is out of scope.
  - Telecom Italia share the same concerns as DT.
  - Huawei have some concerns with the cover sheet. Suggest Cat B. Alternative solutions should be removed from the cover sheet. Suggest removing the SA1 requirement as don't consider that the requirement is addressed by this CR.
  - Telecom Italia wonder whether this is really a barring mechanism, and whether some procedural text can be added.
- => We will introduce the functionality (without any additional requirement on the upper layers compared the draft CR in [R2-163120](#)). CR will be progressed by email.

☒ **[93#21][LTE/Unattended data] 36.331 CR (Verizon)**  
Intended outcome: Agreeable CR to the next meeting  
Deadline: Thursday 05/05/2016

late

[R2-162474](#) Discussion of the solutions to control unattended data traffic Intel Corporation discussion  
late

=> Withdrawn

[R2-162884](#) Restricting Unattended Data Traffic Verizon discussion  
late  
Not treated

## 60ms DRX

[R2-162850](#) SFN Wrap-around issue for 60ms and 70ms CDRX cycles QUALCOMM discussion

- Apple acknowledge the problem and support solution.
- Samsung think this has been discussed before for SPS for example and we decided not to address it.
- Intel would prefer solution 1 or 2

- Huawei also prefer solution 1 or 2. Nokia agree. Apple think if we go with solution 1 or 2 then we should have a note in the spec. Qualcomm agree with Apple.
- => We will not make any functional change to the behaviour
- => RAN2 acknowledges the problem and that it can be avoided by eNB only configuring DRX offsets 0-39 and not 40-59.

[R2-162852](#) SFN Wrap-around issue for 60ms and 70ms CDRX cycles QUALCOMM draftCR 36.321  
13.1.0- - F Rel-13 TEI13

Not treated

[R2-162912](#) Preferred DRX Cycle Reporting QUALCOMM, Apple discussion

NOTE: AT&T also co-singed

- Nokia think this was proposed for eDDA and not agreed and that R13 is frozen. Intel agrees it looks similar to the eDDA proposal.
  - Intel asks if the e2e delay thresholds will be specified or based on implementation. Qualcomm think it may be left to UE but their could be performance requirements.
  - Motorola solutions support the proposal for public safety purposes as he device knows what interval it needs.
  - Ericsson is positive but things it is not in scope in TEI13 but should be considered in Volte enhancements. Huawei agree with Ericsson. Qualcomm think the Volte SI has a specific narrow scope.
- => Noted

[R2-162914](#) Preferred DRX Cycle Reporting QUALCOMM draftCR 36.321 13.1.0- - B Rel-13 TEI13

[R2-162916](#) Preferred DRX Cycle Reporting QUALCOMM draftCR 36.331 13.1.0- - B Rel-13 TEI13

[R2-162913](#) Preferred DRX Cycle Reporting QUALCOMM draftCR 36.306 13.1.0- - B Rel-13 TEI13

Above 3 Tdocs not treated

#### Other

[R2-162193](#) Miscellaneous corrections HTC Corporation draftCR 36.331 13.1.0- - F Rel-13 TEI13

Not treated

[R2-162447](#) Miscellaneous corrections to TS 36.331 Intel Corporation draftCR 36.331 13.1.0- - F Rel-13 TEI13

late

=> Revised in [R2-162989](#)

[R2-162989](#) Miscellaneous corrections to TS 36.331 Intel Corporation draftCR 36.331 13.1.0- - F Rel-13 TEI13 [R2-162447](#)

Not treated

[R2-162448](#) Miscellaneous corrections to TS 36.306 Intel Corporation draftCR 36.306 13.1.0- - F Rel-13 TEI13

late

[R2-162854](#) Clarification on RA-RNTI determination for PRACH in TDD QUALCOMM draftCR 36.321  
13.1.0- - F Rel-13 TEI13

[R2-162924](#) Detecting new inter-RAT neighbours Nokia, Alcatel-Lucent Shanghai Bell discussion

[R2-162925](#) Detecting new inter-RAT neighbours Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331  
13.1.0- - C Rel-13 TEI13

Above 4 Tdocs not treated

Withdrawn:

[R2-162855](#) DRX clarification QUALCOMM draftCR 36.321 13.1.0- - F Rel-13 TEI13  
late

## 8 LTE Rel-14

### 8.1 WI: Enhanced LAA for LTE

(LTE\_eLAA-Core; leading WG: RAN1; REL-14; started: Dec. 15; target: Sep. 16; WID: [RP-160407](#))

Time budget 2TU

#### 8.1.1 UL support for LAA SCell

- [R2-162427](#) RAN2 work scope and work plan for the enhanced LAA WID Huawei, Ericsson discussion P2
- LG think that preamble dropping in LAA is different from DC and would like to discuss more. Ericsson think the reason is different but can be handled in the same way. LG think it is different as in LAA the UE may not be able to transmit for a long time.

Agreements (RAN2 confirms these agreements made during the SI phase):

- Qos related: Configure per bearer/logical channel whether it can be offloaded to LAA SCells or whether it may only be served by licensed carriers.
- HARQ related:
  - 1/ In line with RAN1 recommendation, asynchronous HARQ should be specified for UL HARQ in LAA SCells.
  - 2/ For LAA UL every retransmissions needs to be scheduled by PDCCH
- RACH related: Contention based RA is not supported. Only contention free random access is supported on LAA cells if the NW decides to use RA.

- [R2-162746](#) Modelling of LBT for LAA Ericsson discussion
- Huawei support all 3 proposals
  - DOCOMO think there is a case for PHR transmission where the PHR calculation need to be based on time when transmission is performed.

Agreements

RAN2 model of LBT operation:

- 1 Higher layers (e.g. MAC) are not expected to know the outcome of LBT when building the respective PDUs.
- 2 PHY can indicate to higher layers (such as MAC) if a transmission was not performed due to LBT.

#### Random access

- [R2-162745](#) Impact on Random Access due to LBT Ericsson discussion P2
- Huawei think P2 means that we have a separate counter for ramping and for number of preamble transmission opportunities.
  - LG think the consequence of P2 is that there are fewer transmission opportunities. Think this was discussed before and is not preferred. BlackBerry has the same concern as LG.
  - Nokia support P2 so the eNB knows how long the dedicated preamble is being used. DOCOMO also support the proposal.
  - Ericsson think if there is an issue then the eNB can configure a higher max preamble transmissions for LAA cells.
  - Samsung think it is more important to know that the UE will reach max power. Ericsson want to know that the UE only uses dedicated preambles for a known time.

Agreements

- 1 The UE does not increase the preamble transmission power when a preamble is not transmitted due to LBT.
- 2 For dedicated preambles there will be a limit for how long the UE can use that preamble (how this is achieved in spec is FFS)

[R2-162428](#) Consideration on RACH for LAA SCell Huawei, HiSilicon discussion

- Ericsson support all the proposals. Nokia also support.

P5

- LG do not support P5. eNB and UE may have a different view of whether the LAA cell is busy and hence this may happen. Huawei think this can be avoided by RSSI measurements to detect whether the cell is busy. Intel think in the multiple cell case the UE could check LBT on multiple cells and transmit preamble on one. RAN1 is discussing this and we can leave it for them to decide. LG also think that RAN1 is discussing this issue.

P1bis

- BlackBerry ask if SR can be transmitted on LAA cell. Samsung understand the RAN1 agreement was that we only have non contention based RA, and support all the proposals

P3

- Intel understand that RAR could be send on LAA cells so think more discussion is needed. This avoids coordination of PRACH resources between cells. DOCOMO support the proposal as it is based on current CA.

Agreements

1: Only PDCCH order triggered RACH is allowed for LAA SCell;

2: For LAA SCell(s), RAR can be transmitted via PCell.

FFS whether RAR can be transmitted via SCells

3: UL grant in RAR should be respected even if there is no data for transmission in the UL buffers.

=> Send LS to RAN1 to confirm whether the lower layer will indicate power ramping suspension in case PRACH transmission is blocked by LBT.

=> Other agreements relevant to RAN1 can be added.

=> Draft LS in [R2-163109](#) (Huawei)

[R2-163109](#) [Draft] LS on Consideration on RACH for LAA SCell (to: RAN1; cc: -; contact: Huawei)

Huawei LS out Rel-14 LTE\_eLAA-Core

=> Remove from "[1] raised " to infinity

=> Remove the Annex

=> Remove attachment

✓ => Approved in [R2-163146](#)

[R2-162471](#) RACH procedure for UL LAA Intel Corporation discussion

P5

- DOCOMO think P5 only relates to the case that RAR is sent on SCell but we have not yet concluded on that.

P6

- Ericsson think this is legacy behaviour and so doesn't need to be captured. Nokia thinks that if we only support contention free then there is no Msg3.

=> Noted

[R2-162911](#) RACH Procedure for Enhanced LAA QUALCOMM CDMA Technologies discussion

- Nokia think that with CFRA we don't have message 3, so we already have a 2 step RA.

=> Noted

[R2-162895](#) Random Access aspect in LAA LG Electronics Inc. discussion

- BlackBerry think if the cell is congested and UE can't transmit preamble then there is no value to get TA with the cell. Nokia think that the eNB can always send a new PDCCH order.
- Ericsson think we shouldn't assume the channel can be so busy tha UE can't transmit preamble for long time. Huawei have the same view as Ericsson and eNB has the means to know if the channel is busy, so we don't need to optimise this case.
- LG explain the motivation is that the eNB and UE have a different view of whether the channel is busy. A new PDCCH order will not be as quick as UE attempting via another cell.
- Samsung think this can be handled by RSSI.

=> Noted

- [R2-162393](#) Random Access for eLAA Samsungdiscussion  
- Not treated as already covered by earlier papers

## UL HARQ

- [R2-162669](#) RAN2 aspects of UL LAA Nokia, Alcatel-Lucent Shanghai Bell discussion  
P3  
- Huawei support proposal 3.  
P4  
- Huawei prefer to use eMTC UL HARQ as a baseline.  
- Ericsson also prefer to use eMTC as baseline.

### Agreements:

- 1: Confirm the SI agreement that similar to normal CA no cross serving cell HARQ retransmissions are supported.

### P7

- Nokia confirm that their intention to allow reuse of current LCP.
  - BlackBerry think there is a penalty to choosing a higher priority class. The UE gets shorter access to the channel. In UL the UE gets a grant and the UE can just fill it following the LCP rules.
  - Ericsson think that the PBR rules means that some of the highest priority data is left in the UE buffer and lower priority data is transmitted. This is not in line with RAN1's rules.
  - BlackBerry think RAN1 should not define any rules on this. We should do the work.
  - Qualcomm think that we should just use our legacy rules.
  - MediaTek understand that RAN1 are also discussing multi subframe grants and this will have an impact. BlackBerry think the length is determined from the eNB so the UE can just use it as today.
- => Inform RAN1 that we have defined LCP for multiplexing of UL data and we want to use this unchanged for UL LAA. RAN1 asked to consider this in their work.
- => Can be included in the LS from Huawei.

- [R2-162430](#) UL HARQ handling for LAA SCell Huawei, HiSilicon discussion  
P2bis

- Ericsson think the HARQ RTT timer could be shorter for LAA UEs compared with MTC UEs. Prefer to ask RAN1 what the RTT should be.
- Nokia suggest to ask RAN1 whether PHICH will be used.

### Agreements

- 1 The following agreements on asynchronous HARQ for LAA SCell as baseline.
- 1a For asynchronous uplink HARQ, the counter for maximum number of retransmission is not used.
- 1b Introduce UL HARQ RTT Timer and UL DRX retransmission timer per HARQ process.
- 1c drx-ULRetransmissionTimer is started on the subframe UL HARQ RTT Timer has expired.
- 2a PHICH will not be required to provide explicit feedback for asynchronous UL HARQ.
- 2b eNB uses NDI to trigger (re)transmissions.
- 2c State variable HARQ\_FEEDBACK is not used or maintained for asynchronous UL HARQ.
- 2d Uplink HARQ RTT Timer length is set for 4 subframes.
- 3 For asynchronous HARQ on LAA SCell, HARQ buffer is not flushed.
- 4 Uplink HARQ RTT Timer is started in the subframe containing the indicated PUSCH transmission.

- [R2-162470](#) UL HARQ and DRX for UL LAA Intel Corporation discussion  
P4

- Ericsson think we have frame structure 3 so it can't be considered as TDD. Intel think the issue is how we define the DL subframes of LAA cells. Ericsson think it is too early to decide.

- BlackBerry think in frame structure the UE should not be expected to know that the subframe structure has changed before it wakes up for DRX. UE just wakes up and looks for PDCCH.
  - CATT agree the intent to reconsider this. Also agree it should not be regarded as a TDD cell.
  - Huawei think how the UE detects the current SF is DL or UL needs to be decided by RAN1.
  - Nokia think if we went for Option 4 it would not matter how the UE knows whether a SF is DL or SL. LG thinks that the baseline should be option 1.
  - Samsung think the baseline is R13 which is option 1.
  - CATT think there should be no problem as the LAA cell is aggregated with a PCell.
- => Noted

[R2-162896](#) LBT impact on UL HARQ operation LG Electronics Inc. discussion

- Not treated as covered b previous discussions.

[R2-162744](#) Dropping of initial UL HARQ transmission in LAA Ericsson discussion

- BlackBerry think we agreed that the UE can not react to the outcome of LBT. In the example in SF 6 the UE doesn't have time to react and build a new transmission.
  - Nokia think this only makes sense if the UL grant is of the same size. It would require a lot of conditions to be useful.
  - Qualcomm think changing this on the fly is not easy to do. Samsung share the view of Qualcomm.
  - LG want to understand the problem as there is reordering in RLC. Ericsson think the intent is to avoid delay due to reordering. LG think the total delay will be the same. BlackBerry agree that it will be the same
- => Noted

[R2-162743](#) Asynchronous UL HARQ for LAA Ericsson discussion  
P2

- Intel ask if P2 is in the scope of the WI.
  - BlackBerry understand that this is always used on MTC cells and would always be used on LAA cells.
  - Qualcomm would like to understand the benefit for the licenced cell.
  - Nokia think it is not part of this WI.
- => Noted

## QoS handling

[R2-162469](#) Uplink QoS support for UL LAA Intel Corporation discussion

- Ericsson would like to map a logical channel to a cell rather than mapping or LAA vs non LAA cell. Intel think for this WI then mapping to LAA/non-LAA is sufficient. Ericsson think the use case is that different cells can have different bandwidths, etc. LG agree with Ericsson view that a general mapping to cell is better. Huawei agree with LG.
  - Intel think it is not just an RRC signalling issue but also the functionality in MAC.
  - Nokia think this will require quite a lot of signalling if we indicate cell(s) per logical channel.
  - Samsung wonder what is the intent to go beyond just licenced and unlicensed.
  - MediaTek think it is limiting to say a logical channel can only be carried by a certain cell.
  - Nokia think earlier we discussed and agree that all cells are equal and there is not good reason to deviate from this apart from unlicensed cells.
  - LG think we anyway agreed in the SI that SRB would only be mapped to the licenced cells.
- => Noted

[R2-162429](#) Considerations on QoS control and UL transmission on LAA Scell Huawei, HiSilicon discussion

- Ericsson agree that MAC CEs should not be limited from being sent on LAA SCells. Hence support the proposal. LG think it is much simpler to limit to the licensed cell. Samsung agree with LG. Nokia agree with Ericsson.
- Samsung think that BSR over LAA cell may increase the UL grant delay.
- DOCOMO agree with Samsung and LG. LG think it is a trade off between reliability and delay and we should consider the reliability perspective.

- BlackBerry think from delay point of view the UE should be able to use the first UL grant , from any cell. Ericsson think we should assume the LAA cell is heavily loaded.
- => SPS/TTI bundling is not configured for LAA SCell.

[R2-162394](#) UL scheduling for eLAA Samsungdiscussion  
- Not treated as covered by previous discussion.

[R2-162748](#) Routing restrictions in LAA Ericsson discussion  
- Not treated as covered by previous discussion.

[R2-162858](#) Logical Channel Prioritization in LAA LG Electronics Inc. discussion  
- Not treated as covered by previous discussion.

[R2-162368](#) On priority classes for uplink LBT MediaTek Inc. discussion  
P3  
- Qualcomm think RAN1 is discussing priority classes. MediaTek think RAN2 should inform RAN1 what we are thinking. Huawei think that we should discuss the Nokia paper first.  
P2  
- Ericsson think it is not yet clear what priority classes will be agreed for UL. Too early to discuss. MediaTek agree this is happening in RAN1. Ericsson clarify that the PDCCH might indicate to the UE what LBT class should be used.  
=> Noted

[R2-162747](#) Multi-subframe scheduling Ericsson discussion  
[R2-162894](#) PHR aspect for supporting UL LAA LG Electronics Inc. discussion  
Above 2 Tdocs not treated

## 8.1.2 Other

[R2-162465](#) RRC Consideration of UL LAA Intel Corporation discussion  
[R2-162635](#) UE measurements and reporting in eLAA Sony discussion  
Above 2 Tdocs not treated

✉ **[93#02][LTE/eLAA] Running stage 2 CR (Huawei)**  
Intended outcome: Endorsed running CR  
Deadline: Thursday 21/04/2016

## 8.2 WI: Support for V2V services based on LTE sidelink

(LTE\_SL\_V2V-Core; leading WG: RAN1; started: Dec. 15; target: Sept 16; WID: [RP-160649](#))

Time budget: 1.5 TU

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex G.**

### 8.2.1 Resource allocation

Resource allocation and scheduling related aspects, including possible enhancements, handling of resources pools, etc.

#### Incoming LS:

[R2-162105](#) LS on Geo Information Resource Mapping ([R1-161312](#); cocontact: Qualcomm) RAN1 LS in to: RAN2 Rel-14 LTE\_SL\_V2V-Core  
*moved from 3.2*

[R2-162197](#) Discussion on SPS Enhancements for V2V Guangdong OPPO Mobile Telecom. discussion  
[R2-162224](#) Geo Information in AS Layer CATT discussion  
[R2-162284](#) QoS requirements for V2X services Huawei, HiSilicon discussion  
[R2-162285](#) Draft LS on V2X QoS support Huawei, HiSilicon LS out  
[R2-162286](#) Support of QoS for PC5-based V2V transport Huawei, HiSilicon discussion  
[R2-162287](#) Mode2 Resource Configuration based on Geo Information Huawei, HiSilicon discussion  
[R2-162340](#) V2V Geo Information Resource Mapping Panasonic discussion

- [R2-162353](#) Discussion on UE Location Reporting for PC5-based V2V Shenzhen Coolpad Technologies discussion
- [R2-162399](#) Geo based resource allocation ZTE Corporation discussion
- [R2-162454](#) SL resource allocation in SPS manner Intel Corporation discussion
- [R2-162455](#) Support of robust resource allocation to temporal mobility interruption Intel Corporation discussion
- [R2-162456](#) Location based SL resource allocation Intel Corporation discussion
- [R2-162486](#) Discussions on Sensing Mechanism for V2V Mode 2 Resource Allocation ITRI discussion
- [R2-162731](#) RAN2 aspects of V2V Qualcomm Incorporated other
- [R2-162812](#) DRAFT LS on V2X Subscriber Information Ericsson LS out
- [R2-162813](#) UE Feedbacks for V2X Ericsson discussion
- [R2-162818](#) Sidelink Resource Allocation in V2X Ericsson discussion
- [R2-162831](#) Discussion on Sensing with Semi-Persistent Transmission for V2V Interdigital Asia LLC discussion
- [R2-162923](#) Resource allocation enhancement for V2V LG Electronics Inc. discussion
- [R2-162926](#) Reporting mechanism of geo-Information for PC5 V2V LG Electronics Inc. discussion
- [R2-162927](#) SL SPS enhancement for V2V LG Electronics Inc. discussion
- Withdrawn:**
- [R2-162131](#) LS on Geo Information Resource Mapping ([R1-161312](#); contact: Qualcomm) RAN1 LS in to: RAN2 Rel-14 LTE\_SL\_V2V-Core withdrawn due to duplication of [R2-162105](#)

## 8.2.2 Other

*Other aspects related to V2V*

- [R2-162196](#) Discussion on Basic Procedure for V2V Guangdong OPPO Mobile Telecom. discussion
- [R2-162288](#) Inter-carrier Inter-PLMN operation for Scenario 1 Huawei, HiSilicon discussion
- [R2-162289](#) Configuration of PC5 and/or Uu for V2V transport Huawei, HiSilicon discussion
- [R2-162290](#) Sidelink resource configuration during handover Huawei, HiSilicon discussion
- [R2-162401](#) Discussion on the V2V path selection between Uu and PC5 ZTE Corporation discussion
- [R2-162810](#) Layer- 2 Protocol Stack for PC5-based V2X Ericsson discussion
- [R2-162811](#) Discussion on PC5 multiple carrier Ericsson discussion
- [R2-162946](#) Path switching and channel aspects for V2V LG Electronics Inc. discussion

## 8.3 SI: Study on enhancement of VoLTE

(FS\_LTE\_eVoLTE; leading WG: RAN2; REL-14; started: Mar. 16; target: Sep. 16; SID: [RP-160563](#))

Time budget 1.5TU

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex H.**

### 8.3.1 Codec mode/rate selection/adaptation

- [R2-162214](#) Considerations on Vocoder Rate Adaptation Qualcomm Incorporated discussion
- [R2-162422](#) Codec selection and adjustment China Mobile Com. Corporation discussion
- [R2-162473](#) Considerations on the scope of the VoLTE enhancements study Intel Corporation discussion
- [R2-162560](#) Discussion on the adaptive codec rate change ZTE Corporation discussion
- [R2-162647](#) RAN based codec adaptation mechanism Huawei, HiSilicon discussion
- [R2-162649](#) draft LS to SA4 on RAN based codec adaptation solution Huawei, HiSilicon discussion late
- [R2-162650](#) Analysis on ECN-triggered codec adaptation solution Huawei, HiSilicon discussion
- [R2-162716](#) RAN considerations for codec rate adaptation Kyocera discussion
- [R2-162737](#) Enhanced Codec Control MediaTek Inc. discussion late
- [R2-162843](#) Rate adaptation for voice and video communication services Ericsson discussion

### 8.3.2 VoLTE/video signalling related enhancements

E.g prioritisation of VoLTE/video related signalling, reduction of call drop probability, etc

[R2-162648](#) Signalling optimization for VoLTE Huawei, HiSilicon discussion

### 8.3.3 VoLTE/video quality related enhancements

Enhancements to improve the perceived voice/video quality. This aspect of the WI is expected to be RAN1 led.

[R2-162408](#) Discussion on coverage enhancement for VoLTE China Telecommunications discussion

[R2-162651](#) VoLTE coverage enhancement solutions Huawei, HiSilicon discussion

### 8.3.4 Other

[R2-162507](#) Work plan of the Study on enhancement of VoLTE China Mobile Com. Corporation discussion

[R2-162608](#) TR Skeleton for study on voice enhancement for LTEChina Mobile Com. Corporation draft TR36.750 0.0.1 Rel-14 FS\_LTE\_eVoLTE

## 8.4 SI: Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables

(FS\_feD2D\_IoT\_relay\_wearable; leading WG: RAN2; REL-14; started: Mar. 16; target: Jun. 16; SID: [RP-160677](#))

Contributions should focus on evaluating scenarios in RAN2 considering progress in SA WGs. As a result of the identified scenarios and potential impacts/complexity analysis of supporting those scenarios, refine objectives of the SI accordingly.

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex G.**

[R2-162152](#) on future D2D: scenarios and considerations Sequans Communications discussion  
=> revised in [R2-162972](#)

[R2-162972](#) on future D2D: scenarios and considerations Sequans Communications discussion

[R2-162195](#) Discussion on Scenarios and Scope for FeD2D Guangdong OPPO Mobile Telecom. discussion

[R2-162240](#) Consideration on the Enhancement of UE-to-Network Relay Fujitsu discussion

[R2-162354](#) Discussion on UE-to-NW relay architecture enhancements Shenzhen Coolpad Technologies discussion

[R2-162402](#) Considerations on the working scope of R14 feD2D ZTE Corporation discussion

[R2-162516](#) Discussions on Public Safety for FeD2D Innovative Technology Lab Co. discussion

[R2-162529](#) On Scenarios and Objectives for Wearables and feD2D Ericsson discussion

[R2-162636](#) Scope and phasing of D2D Relay enhancements Sony discussion

[R2-162641](#) General technical consideration on PC5 enhancement for UE-To-NW relay Huawei, HiSilicon discussion

[R2-162642](#) L2 UE Relay technology consideration for wearable Huawei, HiSilicon discussion

[R2-162643](#) Commercial scenario & use case for FeD2D Huawei, HiSilicon discussion

[R2-162695](#) feD2D scope of work clarification Nokia, Alcatel-Lucent Shanghai Bell discussion

[R2-162714](#) Initial considerations of ProSe Relay operation for wearable devices Kyocera discussion

[R2-162720](#) Discussion on FeD2D scenarios Intel Corporation discussion

[R2-162741](#) Scenarios for FeD2D Qualcomm Incorporated other

[R2-162922](#) Scenarios and Scope of feD2D LG Electronics Inc. discussion

## 8.5 WI: Enhanced LTE-WLAN Aggregation (LWA)

(LTE\_WLAN\_aggr-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Mar. 17; WID: [RP-160600](#))

Time budget 1.5TU

### 8.5.1 Uplink over WLAN

[R2-162183](#) Discussion on Support of UL Bearer in Rel-14 LWA CATT discussion  
P1

- Xinwei ask what is the destination address for packet in the UL. CATT explain that this is the WT MAC address. Xinwei think the WT MAC address can be used to identify that a PDCP PDU is carried.
- MediaTek think identify the PDCP PDU is independent from routing packet.
- Qualcomm think the UE may not know the WT MAC address.
- Ericsson think we can't make an agreement now.
- MediaTek ask why we are repeating the R13 discussion, and there may be no WT. Intel agree with MediaTek. Samsung also agree and anyway we would need to decide what ethertype field would have to be used. Qualcomm also support this. TCL also agree. Huawei also agree to this.

P5

- Samsung understand that P5 is related to switched bearer and Samsung would like to have only switched bearer.

#### Agreements

- 1: For Rel-14 LWA, UL PDCP PDU transmitted over WLAN is identified by using the same Ethertype value as that used in DL.
- 2 In Rel-14 LWA, multiple UL LWA bearers per UE on WLAN link should be supported.
- 3: LWAAP layer is also used to support UL LWA bearer transfer for Rel-14 LWA.
- 4: LTE buffer status information will not be reported over the WLAN link.
- 5: It is proposed to adopt figure 3 as the updated overall protocol model for LWAAP in TS36.360

#### [R2-162903](#)

Uplink transmission on WLAN for LWA QUALCOMM CDMA Technologies discussion

P3

- Ericsson ask if this means we will not have switched bearer. Qualcomm assume that we will have a switched bearer similar to R13 but intent here is to have one bearer type.
- Apple think this is too early to conclude.
- Mediatek think the DL the eNB can control where packets are sent but for UL there is no way for eNB to ensure all packets are sent over WLAN so we may need separate bearer types. Qualcomm think we can still do this with a single bearer type.
- BlackBerry have the same view as Samsung that there should only be switched bearer.

P5

- Apple thinks it is difficult for eNB to control transmission on WLAN.

P8

- Intel thinks P8 is acceptable.
- MediaTek how the UE would use the feedback from the eNB. Qualcomm thinks this can be discussed. LG think PDCP retransmission is only for limited special cases but think this proposal suggests some dynamic ongoing retransmissions. Qualcomm consider this might be used when switching between LTE and WLAN

=> Noted

#### [R2-162369](#)

Uplink scheduling and QoS management for enhanced LWA MediaTek Inc. discussion

P6

- TCL thinks that informing the eNB is not good for latency.
- MediaTek clarify that this means that WLAN has failed to transmit the PDU after the WLAN defined number of attempts. Intel ask if this is addressed by WLAN status indication. It doesn't make sense to tear down after 1 PDU has failed. Apple think it is hard to conclude that WLAN has a problem due to one failure to transmit. MediaTek think this will not happen all the time.
- Qualcomm think treating this as RLF is overkill.
- Ericsson can acknowledge the problem but not this solution.

P8

- CATT think for DL it is WT implementation and for UL it could be left to the UE.
- MediaTek think that WT has to do a mapping to ensure QoS is met.
- Intel see the concerns of MediaTek, but prefer UE to be able to decide.
- Ericsson think we should have an understanding of how the UE should do this.
- Nokia think network should understand what UEs could do.
- Huawei think it could be left to UE implementation and is out of RAN2 scope.
- BlackBerry think the UE knows the bearer type and this can be used.

=> Noted

- [R2-162795](#) Uplink for eLWA Ericsson discussion  
[R2-162531](#) Uplink data transmission over WLAN for LWA Huawei, HiSilicon discussion  
[R2-162494](#) Specifying uplink over WLAN Nokia, Alcatel-Lucent Shanghai Bell discussion  
[R2-162495](#) Control plane impacts of uplink over WLAN Nokia, Alcatel-Lucent Shanghai Bell discussion  
[R2-162181](#) protocol architecture enhancement and Xw bearer establishment for eLWA Beijing Xinwei Telecom Techn. discussion  
[R2-162180](#) the BSR design for the LWA bearer Beijing Xinwei Telecom Techn. discussion  
[R2-162261](#) Data routing issues between UE and WT for uplink transmission in WLAN side Beijing Xinwei Telecom Techn. Discussion  
[R2-162395](#) Uplink issues for eLWA Samsungdiscussion  
[R2-162458](#) Uplink support for LWA Intel Corporation discussion  
[R2-162626](#) BSR procedure for eLWA HTC Corporation discussion  
[R2-162630](#) Uplink bearer types for eLWA HTC Corporation discussion  
[R2-162715](#) Consideration on uplink data transmission for eLWA Kyocera discussion  
[R2-162789](#) Uplink bearer split for LTE WLAN radio aggregation TCL Communication Ltd. discussion  
[R2-162185](#) Text Proposal for LWAAP to Support of UL Bearer in Rel-14 LWA CATT discussion  
NOTE: wrong Tdoc type used; TP is not allowed for spec under change control  
Above 14 Tdocs not treated

## 8.5.2 Mobility enhancements

E.g. intra and inter eNB handover without WT change, enhancements to WT change, etc

### HO without WT change

- [R2-162793](#) Mobility optimizations for eLWA Ericsson discussion
- Intel agree that an LS should be sent to SA3. Regarding proposal 2, we see some benefit is SA3 can find some solution.
  - LG agree with Intel. From UE perspective there is no mention of WT change, that is just RAN3 issue. We should consider both scenarios with this WI.
  - Huawei think it needs to be clarified if re-association is needed. Qualcomm think it will be needed but we can send LS to SA3. Ericsson think this exists today if the mobility set is changed.
  - Intel think HO without WT change is for RAN2 to discuss. With WT change can be considered in RAN3. We should send LS to SA3 on the security issues.
- => For the eNB key based method, ask SA3 if the UE performs HO and KeNB is changed and the UE is already associated with WLAN, can the UE continue with the existing key or must the UE apply the new key (e.g. by re-association, or something different, etc).
- => Draft LS to SA3 (Ericsson) in [R2-163117](#)
- [R2-163117](#) [Draft] LS to SA3 on Mobility optimizations for eLWA (to: SA3; cc: -; contact: Ericsson)  
Ericsson LS out Rel-14 LTE\_WLAN\_aggr-Core
- [R2-163145](#) [Draft] LS to SA3 on Mobility optimizations for eLWA (to: SA3; cc: -; contact: Ericsson)  
Ericsson LS out Rel-14 LTE\_WLAN\_aggr-Core
- => Remove " when is the new S-KWT key derived from the new KeNB taken into use by the UE? Or " and add " after handover " at the end of the sentence.
- => Add " SA3 to consider feasible solutions "
- => Approved in [R2-163147](#)
- [R2-162904](#) LTE mobility without WT change QUALCOMM CDMA Technologies discussion
- Kyocera understand that the intent is to enable WLAN to continue during the HO and asks if this can be applied to the UL. Qualcomm think the UE can continue to send UL data on WLAN during the handover. Samsung think this is not possible due to data forwarding. Intel think the WT addition should be before the handover command is sent.
  - Ericsson think we can't conclude this now without feedback from SA3. Huawei agree with Ericsson.
  - Intel think a parallel option might be possible.
  - Qualcomm think we could discuss this as it affects interruption.
- => RAN2 can discuss principle of the inter-eNB handover without WT change (e.g. whether we want to support delta configuration) but we leave details of the network call flow to RAN3.

- [R2-162496](#) Handling PDCP ciphering-key change in continued LWA Nokia, Alcatel-Lucent Shanghai Bell discussion
- Intel think this depends on the response from SA3.
  - Ericsson think this assumes that we have already decided that we will keep the LWA configuration and hence have the problem to solve.
  - Samsung think this only occurs if there is the possibility to cipher with the old and new key at the same time. So it is too early to ask at the moment.
- => Noted
- [R2-162530](#) Mobility optimization for LWA Huawei, HiSilicon discussion
- [R2-162407](#) Discussion on Inter-eNB handover without WT change for LTE-WLAN aggregation China Telecommunications discussion
- [R2-162187](#) Discussion on Inter-eNB Handover Procedure for Rel-14 LWA CATT discussion
- [R2-162689](#) LTE handover preparation while keeping LWA NEC Telecom MODUS Ltd. discussion
- [R2-162934](#) Handover without releasing LWA configuration LG Electronics Inc. discussion
- Above 5 Tdocs not treated

#### Enhancements to WT change

- [R2-162460](#) Mobility enhancements for LWA Intel Corporation discussion
- [R2-162184](#) Discussion on Enhancement for Change of WT Procedure CATT discussion
- Above 2 Tdocs not treated

#### Other

- [R2-162459](#) Suspend/resume functionality for LWA Intel Corporation discussion
- Not treated

### 8.5.3 Support of 802.11ax, 802.11ad, and 802.11ay

- [R2-162371](#) Scenarios for enhanced LWA MediaTek Inc. discussion
- Moved from 8.5.6 to 8.5.3

#### P2

- Qualcomm ask why this information is needed. MediaTek think it would be good to understand the data rates and we might decide on switched bearer only if the rate is very high.
- CATT share the intention of MediaTek, but think for R14 we should not support ax and ay as they are not complete. For ad it is good to ask IEEE on the scenario so we can decide.
- Apple think that ax is progressing and they will be finished soon and scenarios are not much different from ac. Broadcom agree with Apple. IEEE could give us good information
- Intel agree with Apple and Broadcom.
- Ericsson think the WID objective is potential enhancements and so we should discuss. Qualcomm understands we will add support and the potential refers to what enhancements will might need.
- Huawei support CATT's views.
- MediaTek think we should not discuss the IEEE technologies.
- Intel think we will not list the versions that are supported in our specs. What we will need to refer to are the bands for example.

#### P3

- MediaTek agree this is an open question but it is good to ask them.
  - Nokia think we don't need to ask IEEE anything at this time.
  - Intel support the proposal to send an LS.
  - BlackBerry support sending an LS.
- => Noted

- [R2-162374](#) Draft LS on enhanced LTE-WLAN Aggregation (eLWA) MediaTek Inc. LS out
- Not treated
- Moved from 8.5.6 to 8.5.3

### 8.5.3.1 Control plane enhancements

E.g. support 60 GHz band and channels in measurements,

- [R2-162562](#) Supporting of 60 GHz new band and increased data rates in WLAN Huawei, HiSilicon discussion
- Qualcomm thinks that the WID clearly states that we will support these bands. Intel agree with Qualcomm.
  - Ericsson think there are no RAN4 requirements on measurement on 60GHz. Intel agree with this but that can be discussed more, it doesn't mean that we can't support it. Apple think that if something is needed in RAN4 then it can be done. MediaTek think that if the need is found we can add requirements.
  - CATT agree with Huawei, and think ad is not intended for the traditional use case of 802.11.
  - Huawei think it is not clear if IEEE have define measurement performance that we can refer to.
  - Sprint think this is a specific question we could address to IEEE.
- => Ask IEEE if they have defined measurements and measurement performance requirements for 60GHz to which 3GPP could refer. Ask if the measurements for different technologies are different.
- => Draft LS in [R2-163118](#) (MediaTek)
- [R2-163118](#) [Draft] LS to IEEE on eLWA (to: IEEE; cc: -; contact: MediaTek) MediaTek Inc. LS out Rel-14 LTE\_WLAN\_aggr-Core
- => Keep the first line
- => Remove other yellow parts
- => Approved in [R2-163148](#)

- [R2-162461](#) Control plane aspects of 60GHz support for LWA Intel Corporation discussion
- => Noted

- [R2-162792](#) Enhancements to support 60 GHz new band and increased data rates Ericsson discussion
- [R2-162192](#) Discussion on CP Aspect to Support 60GHz and High-rate WLAN CATT discussion
- Above 2 Tdocs not treated

### 8.5.3.2 User plane enhancements

E.g. enhancements for increased data rates of 802.11ax, 802.11ad, and 802.11ay, etc

- [R2-162191](#) Discussion on UP Aspect to Support 60GHz and High-rate WLAN CATT discussion
- [R2-162462](#) User plane aspects of high data rate 802.11 technologies support for LWA Intel Corporation discussion
- [R2-162859](#) BSR issue in UL LWA bearer LG Electronics Inc. discussion
- [R2-162860](#) PDCP reordering enhancement for LWA bearer LG Electronics Inc. discussion
- Above 4 Tdocs not treated

## 8.5.4 Feedback enhancements

E.g. additional information collection and feedback e.g. for better estimation of available WLAN capacity and LWA performance improvement

- [R2-162677](#) Reporting of WLAN channel availability information NEC Telecom MODUS Ltd. discussion
- [R2-162463](#) Considerations for additional WLAN metrics Intel Corporation discussion
- [R2-162906](#) Feedback Enhancements for LWA QUALCOMM CDMA Technologies discussion
- [R2-162794](#) On feedback optimization for eLWA Ericsson discussion
- [R2-162936](#) Further enhancement of WLAN measurement report LG Electronics Inc. discussion
- [R2-162186](#) UE Location Collection for WLAM Mobility Set Configuration CATT discussion
- [R2-162479](#) Discussion on the benefits of additional feedback enhancements ITRI discussion
- [R2-162935](#) Further enhancements of WLAN connection status report LG Electronics Inc. discussion
- Above 8 Tdocs not treated

## 8.5.5 ANR for LWA

Discussion on ANR expected to start in RAN3 before progressing in RAN2.

- [R2-162464](#) ANR aspects of LWA Intel Corporation discussion
- [R2-162497](#) ANR for enhanced LWA Nokia, Alcatel-Lucent Shanghai Bell discussion
- [R2-162878](#) The necessity of ANR enhancement for LWA Huawei, HiSilicon discussion
- Above 3 Tdocs not treated

**Withdrawn:**

- [R2-162535](#) The necessity of ANR enhancement Huawei, HiSilicon discussion

## 8.5.6 Other

No contributions received.

## 8.6 WI: Further mobility enhancements in LTE

(LTE\_eMob-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Dec. 16; WID: [RP-160636](#))

Time budget 1TU

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex H.**

### 8.6.1 RACH-less handover

- [R2-162409](#) Discussion on solutions to minimize service interruption China Telecommunications discussion
- [R2-162410](#) RACH-less Handover for Mobility Enhancement Huawei, HiSilicon discussion
- [R2-162517](#) Consideration on RACH-less handover CATT discussion
- [R2-162532](#) Discussion of solution 1: RACH-less handover Intel Corporation discussion
- [R2-162699](#) RACH-less Handover to reduce the length of service interruption Nokia, Alcatel-Lucent Shanghai Bell discussion
- [R2-162910](#) Comparison of Mobility Improvements for LTE QUALCOMM CDMA Technologies discussion

### 8.6.2 Make before break handover

- [R2-162232](#) Overview of solutions for the LTE mobility enhancements Samsung Electronics Co., Ltd discussion
- [R2-162411](#) Support of Simultaneous Data Transmission in the Source and Target Sides Huawei, HiSilicon discussion
- [R2-162444](#) Mobility enhancement for SCG change Samsung
- [R2-162519](#) Considerations on SeNB change in DC CATT discussion
- [R2-162563](#) Interruption analysis on mobility events ZTE Corporation discussion
- [R2-162564](#) User throughput evaluation on mobility events ZTE Corporation discussion  
=> revised in [R2-162963](#)
- [R2-162963](#) User throughput evaluation on mobility events ZTE Corporation discussion
- [R2-162565](#) Evaluation of solutions on service interruption enhancement ZTE Corporation discussion
- [R2-162719](#) Discussion of solution 2: Maintaining source eNB connection during handover Intel Corporation discussion
- [R2-162833](#) Scenarios for mobility enhancements in CA and DC Intel Corporation discussion
- [R2-162899](#) Considerations on Solution 1 and 2 for Mobility Enhancements ETRI discussion

### 8.6.3 Other

- [R2-162561](#) Tentative work plan of mobility enhancement ZTE Corporation discussion

## 8.7 WI: Further Indoor Positioning enhancements for UTRA and LTE

(UTRA\_LTE\_iPos\_enh2-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Dec. 16; WID: [RP-160538](#))

Time budget 0.25TU

## 8.7.1 OTDOA and CID/E-CID enhancements

Input from RAN1 required before RAN2 can progress this AI.

- [R2-162472](#) Introduction of OTDOA enhancements Intel Corporation draftCR 36.355 13.1.0- - B  
Rel-14 UTRA\_LTE\_iPos\_enh2-Core  
- Intel gave update on RAN1 progress. Not sufficient progress to discuss in RAN2 yet.  
- Not treated

## 8.7.2 Enhancements for WLAN, Bluetooth, Barometric, and MBS

Including addition of assistance data and UE-based positioning

- [R2-162790](#) Assistance Data for Indoor positioning enhancements NextNav, AT&T, Broadcom draftCR  
36.305 13.0.0- - B Rel-14 UTRA\_LTE\_iPos\_enh2-Core  
=> Revised in [R2-162978](#)  
[R2-162978](#) Assistance Data for Indoor positioning enhancements NextNav, AT&T, Broadcom draftCR  
36.305 13.0.0- - B Rel-14 UTRA\_LTE\_iPos\_enh2-Core [R2-162790](#)  
=> Removed text starting " Additional information concerning ..." from the new sections on  
barometric and TBS.  
=> Endorsed as running CR in [R2-163119](#)

## 8.7.3 TBS positioning based on PRS

Input from RAN1 required before RAN2 can progress this AI.

No contribution received.

## 8.7.4 Other

No contribution received.

## 8.8 WI: L2 latency reduction techniques for LTE

(LTE\_LATRED\_L2-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Sep. 16; WID: [RP-160667](#))

Time budget 1TU

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex G.**

### 8.8.1 Short SPS

Short SPS period to allow UL prescheduling

- [R2-162237](#) Short SPS period for UL prescheduling Samsung Electronics Co., Ltd discussion  
[R2-162262](#) Collision of new transmission and retransmission in short SPS period Huawei, HiSilicon  
discussion  
[R2-162263](#) Short SPS period in TDD Huawei, HiSilicon discussion  
[R2-162415](#) Remaining issues related to UL SPS China Mobile Com. Corporation discussion  
[R2-162423](#) Impact on DRX with pre-scheduling and short SPS periodicity Nokia, Alcatel-Lucent Shanghai  
Bell discussion  
[R2-162466](#) Further aspects of short SPS interval Intel Corporation discussion  
[R2-162768](#) Introduction of short SPS intervals for UL prescheduling Ericsson discussion  
[R2-162779](#) Introduction of short SPS intervals Ericsson draftCR 36.331 13.1.0- - B Rel-14  
LTE\_LATRED\_L2

### 8.8.2 Skipping of UL grants

Skipping of UL grants (e.g. no in case of dynamic and SPS based UL pre-scheduling. Discuss need for feedback for SPS activation, reactivation and deactivation command.

- [R2-162235](#) Issues on Prescheduling and skipping uplink transmission Samsung Electronics Co., Ltd  
discussion

|                           |                                                                                                                |
|---------------------------|----------------------------------------------------------------------------------------------------------------|
| <a href="#">R2-162236</a> | Discussion on acknowledging SPS command Samsung Electronics Co., Ltd discussion                                |
| <a href="#">R2-162264</a> | On UL grants skipping Huawei, HiSilicon discussion                                                             |
| <a href="#">R2-162265</a> | Implicit SPS release under UL grants skipping Huawei, HiSilicon discussion                                     |
| <a href="#">R2-162266</a> | Necessity of feedback for SPS activation and deactivation Huawei, HiSilicon discussion                         |
| <a href="#">R2-162467</a> | Further aspects of UL grant skipping Intel Corporation discussion                                              |
| <a href="#">R2-162504</a> | Skipping empty BSR and feedback for SPS activation/deactivation Nokia, Alcatel-Lucent Shanghai Bell discussion |
| <a href="#">R2-162515</a> | Feedback for SPS PDCCH command CATT discussion                                                                 |
| <a href="#">R2-162572</a> | Discussion on the feedback of the SPS activation command ZTE Corporation discussion                            |
| <a href="#">R2-162601</a> | Discussion on skipping UL grants ASUSTEK COMPUTER (SHANGHAI) discussion                                        |
| <a href="#">R2-162690</a> | Details of Short SPS procedure for latency reduction ETRI discussion                                           |
| <a href="#">R2-162735</a> | Considerations on skipping UL padding transmissions Sequans Communications discussion                          |
| <a href="#">R2-162780</a> | Skipping padding transmissions Ericsson draftCR 36.321 13.1.0- - B Rel-14<br>LTE_LATRED_L2                     |
| <a href="#">R2-162782</a> | Skip padding option for UL grants Ericsson discussion                                                          |
| <a href="#">R2-162901</a> | Need for feedback of SPS command LG Electronics Inc. discussion                                                |
| <a href="#">R2-162902</a> | SPS feedback transmission LG Electronics Inc. discussion                                                       |
| <a href="#">R2-162909</a> | Open issues for skipping UL grants QUALCOMM CDMA Technologies discussion                                       |

### 8.8.3 Other

|                           |                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------|
| <a href="#">R2-162267</a> | PUSCH resource waste in case of short SPS period Huawei, HiSilicon discussion       |
| <a href="#">R2-162468</a> | SPS activation, reactivation and deactivation feedback Intel Corporation discussion |
| <a href="#">R2-162781</a> | Acknowledgements for SPS commands Ericsson discussion                               |

## 8.9 WI: Signalling reduction to enable light connection for LTE

(LTE\_LIGHT\_CON-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Mar. 17; WID: [RP-160540](#))

Time budget 0.5TU

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex H.**

### 8.9.1 Paging enhancements

E.g. signaling reduction by limiting the paging area.

Note the WID indicates that only the paging objective is to be discussed within Q2 2016

|                           |                                                                                                            |
|---------------------------|------------------------------------------------------------------------------------------------------------|
| <a href="#">R2-162194</a> | Discussion on Paging Signaling Reduction for Light Connection Guangdong OPPO Mobile Telecom. discussion    |
| <a href="#">R2-162275</a> | Work plan for light connection Huawei, Intel Corporation, China Telecom discussion                         |
| <a href="#">R2-162276</a> | Work assumptions and paging optimization in light connection Huawei, China Telecom, HiSilicon discussion   |
| <a href="#">R2-162277</a> | late<br>RAN initiated paging optimization in light connection Huawei, China Telecom, HiSilicon discussion  |
| <a href="#">R2-162278</a> | General aspects for light connection Huawei, China Telecom, HiSilicon discussion                           |
| <a href="#">R2-162514</a> | Discussion on paging in light connection CATT discussion                                                   |
| <a href="#">R2-162520</a> | General principles and paging optimization in light connection Huawei, China Telecom, HiSilicon discussion |
| <a href="#">R2-162556</a> | RAN based paging mechanism Intel Corporation discussion                                                    |
| <a href="#">R2-162612</a> | Considerations on light connection Nokia, Alcatel-Lucent Shanghai Bell discussion                          |
| <a href="#">R2-162717</a> | Initial consideration of paging enhancements for Light Connection Kyocera discussion                       |
| <a href="#">R2-162727</a> | Paging and UP requirements on light connection China Unicom discussion                                     |

### 8.9.2 Other

No contribution received.

## 8.10 SI: Study on Latency reduction techniques for LTE

(FS\_LTE\_LATRED; leading WG: RAN2; started: Mar. 15; target: June 16; SID: [RP-150465](#))

WI complete from RAN2 perspective. No time allocation at this meeting.

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex G.**

No contribution received.

## 8.11 SI: Feasibility Study on LTE-based V2X Services

(FS\_LTE\_V2X; leading WG: RAN1; started: June. 15; target: June 16; SID: [RP-151109](#))

Time budget: 2TU

Documents in this agenda item handled in the LTE Break Out session. **Please see Annex G.**

Including output of email discussion [93#39][LTE/V2X SI] – Additional observations – LG

### Incoming LS

[R2-162116](#) Reply LS to [R1-157821](#) = [R2-161012](#) on clarification of RSU types (S1-160521; contact: LGE)  
SA1 LS in to: RAN2 Rel-14 V2XLTE

moved from 3.2

Moved from 3.2 to 8.11

### 8.11.1 UL enhancements

*Understanding of V2X traffic characteristic, UL SPS enhancements, and any other UL enhancements*

#### Output of email discussion [93#39][LTE/V2X SI]:

[R2-162949](#) Email Report of [93#39][LTE/V2X SI] Additional observations LG Electronics Inc. report late

[R2-162200](#) Discussion on SPS Enhancements for V2X Guangdong OPPO Mobile Telecom. discussion  
[R2-162222](#) Consideration on SPS Enhancement CATT discussion  
[R2-162238](#) Discussion on UL enhancement for the case with high density UE Fujitsu discussion  
[R2-162296](#) Discussion on SPS based on V2X traffic characteristics Huawei, HiSilicon discussion  
[R2-162398](#) SPS enhancements for V2X over Uu ZTE Corporation discussion  
[R2-162814](#) Observations on CAM Message Periodicity and Payload Ericsson discussion  
[R2-162816](#) Other Uu Enhancements for V2X Ericsson discussion  
[R2-162825](#) Possible SPS Enhancements for V2X Interdigital Asia LLC discussion  
[R2-162947](#) UL enhancement for V2X LG Electronics France discussion

### 8.11.2 DL enhancements

*Improvements of MBMS/SC-PTM services on the basis of UE geographical location (whether there is a need for a specific AS mechanism or the application layer mechanism is sufficient), MBMSFN latency, and other DL enhancements.*

[R2-162220](#) Discussion on capacity enhancement of broadcast V2X services CATT discussion  
[R2-162221](#) Discussion on latency enhancement of broadcast V2X services CATT discussion  
*moved from 8.11.1*  
[R2-162239](#) Discussion on the DL enhancement for Uu-based V2V communication Fujitsu discussion  
[R2-162292](#) Uu-based V2V Transport Based on Location Information Huawei, HiSilicon discussion  
[R2-162397](#) Discussion on the eMBMS based V2X broadcast ZTE Corporation discussion  
[R2-162405](#) Reporting geo information to eNB Samsung discussion  
[R2-162453](#) Location based V2V message forwarding in Uu-based V2V Intel Corporation discussion  
[R2-162487](#) Discussion on the MBMS V2V transmission and reception ITRI discussion  
[R2-162700](#) The discussion on operational aspects of MBMS with MBSFN and SC-PTM Nokia, Alcatel-Lucent Shanghai Bell discussion

- [R2-162701](#) The discussion on applicability of geographical information in MBMS for V2X systems  
Nokia, Alcatel-Lucent Shanghai Bell discussion
- [R2-162702](#) Further PRR results for V2X Scenario 2 in Urban case Nokia, Alcatel-Lucent Shanghai Bell  
discussion
- [R2-162728](#) V2X Communications Qualcomm Incorporated other
- [R2-162815](#) Other MBMS Enhancements for V2X Ericsson discussion
- [R2-162819](#) System level performance using SC-PTM Ericsson discussion
- [R2-162821](#) V2X Message Provisioning for MBMS Ericsson discussion
- [R2-162824](#) Discussion on The Use of Location Information for V2X Interdigital Asia LLC discussion
- [R2-162943](#) DL broadcast enhancement for V2X LG Electronics Inc. discussion
- [R2-162967](#) Evaluation results on location based DL broadcasting for V2V LG Electronics discussion  
late

### 8.11.3 Other enhancements

*Need for QoS and potential enhancements, need for mobility enhancements, PC5 enhancements not targeting V2V, etc.*

- [R2-162199](#) Discussion on Handover Enhancements for V2X Guangdong OPPO Mobile Telecom.  
discussion
- [R2-162219](#) Considerations on Mobility Enhancements CATT discussion
- [R2-162291](#) Potential Enhancements for Uu-based V2V Transport Huawei, HiSilicon discussion
- [R2-162406](#) Study on High Mobility Scenario in V2X ZTE Corporation discussion
- [R2-162488](#) Discussion on PC5 handover and Uu handover for V2X ITRI, National Taiwan University  
discussion
- [R2-162491](#) Some consideration of Resource Allocation in V2X Potevio Company Limited discussion
- [R2-162817](#) QoS enhancements for sidelink and Uu Ericsson discussion
- [R2-162820](#) Traffic Management in V2X Ericsson discussion
- [R2-162823](#) Discussion on Mobility Enhancements for V2X Interdigital Asia LLC discussion
- [R2-162945](#) Other enhancements for V2X LG Electronics Inc. discussion

### 8.11.4 Scenarios

New scenarios (simple ones), discussions on V2I/V2N/V2P, and impact of supporting inter-operator deployments

- [R2-162223](#) Remaining issues of V2X Scenarios CATT discussion  
*moved from 8.11.1*
- [R2-162293](#) Operating Scenarios for the Uu-based V2I/V2N/V2P Huawei, HiSilicon discussion
- [R2-162294](#) Discussion on V2I/V2N/V2P transport based on PC5 Huawei, HiSilicon discussion
- [R2-162295](#) Consideration on inter-PLMN operation for Scenario 2 Huawei, HiSilicon discussion
- [R2-162396](#) Some considerations on multi-carrier and multi-operator support for V2V scenarios ZTE  
Corporation discussion
- [R2-162400](#) Discussion on eNB type RSU and UE type RSU ZTE Corporation discussion
- [R2-162457](#) Scenarios for V2P Intel Corporation discussion
- [R2-162822](#) V2X Scenarios Ericsson discussion
- [R2-162944](#) Further discussion on V2X scenarios LG Electronics Inc. discussion

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## 9 SI: Study on New Radio Access Technology

FS\_NR\_newRAT; leading WG: RAN1; REL-14; started: Mar. 16; target: Jun. 17; WID: [RP-160671](#)

Time budget: 6 TUs

### 9.1 Organisational

LSs, work plan, etc

No contribution received.

Comments from chair:

Opportunities for joint sessions with SA2:

- 1/ May 2016, Nanjing
  - 2/ November 2016, USA
- Opportunities for joint sessions with RAN3:
- 1/ May 2016, Nanjing
  - 2/ August 2016, Goteborg
  - 3/ November 2016, USA
- We should decide this meeting if we want to take up the opportunity of a joint session in Nanjing, and decide what topics we would like on the agenda.

## 9.2 General aspects

E.g. high level contributions on general principles, discussion of use cases and scenarios, design targets etc

### [R2-162205](#) 5G TR usage and structure Samsung R&D Institute UK discussion

P1

- DOCOMO agree with the proposal but sometimes case by case we may capture some options and evaluation results.
- LG think the Samsung approach is more like a stage 2. Also ask if it is just for RAN1 or for other WGs. Samsung explain that each WG will have its own TR.
- Nokia strongly support the approach. People can look at meeting minutes to find the reasons for our decisions. Intel have a similar view.
- Huawei agree that for this TR we should just capture agreements.
- Ericsson think this can be discussed case by case.

P2

- Nokia would like the TR to have an overview of the whole RAN, including work from other groups. Nokia some understanding of the whole system is useful, but think that is a RAN decision. DOCOMO think we also have an overall TR that is cross WGs. Nokia see the reason to do this is that we are impacted by what they do.
- Huawei think it is not practical to capture agreement of other WGs and RAN TR can be used for that purpose. ZTE agree with Huawei.
- DOCOMO plan to update the RAN TR each meeting cycle.
- MediaTek think it is could to capture agreements from other groups that impact us.
- DOCOMO think one way is for each meeting the rapporteur can provide a summary of agreements from other groups.

Agreement:

- 1: RAN2 TR should only contain information for which there is agreement that it would make sense to follow-up this aspect in a future WID. In limited cases RAN2 may decide to include major options.

✉ **[93#22][NR] TR skeleton structure (DOCOMO)**

**Discuss skeleton structure for RAN2 NR TR**

Intended outcome: Draft skeleton to next meeting

Deadline: Thursday 05/05/2016

### [R2-162892](#) General management of NR study NEC discussion

- Samsung clarify that the RAN2 ToR include protocol termination points.
- => RAN2 assume that each group will work according to existing ToR.

### [R2-162652](#) General considerations on the new RAN Huawei, HiSilicon discussion

- Nokia think it is useful to understand the issue but not sure it is needed to capture in the TR. Qualcomm think these will be captured as headings in the skeleton.
  - Huawei think it would be good to have a common view of what issues we need to address.
  - DOCOMO think it is good to have some understanding but think this should be covered by the SID and this proposal seems aligned.
  - Nokia think in the past we have not done this and the SID objectives should be clear. Intel think this is covered by SI, status report.
- => Noted

### [R2-162206](#) TR Objectives and Guidelines Samsung R&D Institute UK discussion

- Intel think in principle this is ok but not sure this needs to be captured. Ericsson agree.

- LG are ok with the principle but wonder if it applies to the standalone case.
  - Huawei also share this view and are ok to capture in the TR.
  - DOCOMO agree with Huawei. IDC agree the principle but don't see a need to capture. We should design to meet the requirements. CMCC also doesn't see the need to capture this.
- => When designing the 5G radio protocol architecture/radio protocols, RAN2 should consider reuse of LTE designs where sensible.

## Deployment scenarios

[R2-162499](#) Multi-connectivity considerations for New Radio Nokia, Alcatel-Lucent Shanghai Bell discussion

- IAESI think that some of the functions of the S-GW will appear to be in the RAN.
  - LG ask if the UE will have to support all these different deployment scenarios. It would be nice if these are not visible to the UE or there are limited options.
  - Huawei ask if these scenarios all needed to be supported from the first day. Nokia we need to architecture in place to support these.
  - DOCOMO think there are 2 aspects to multiconnectivity - one is interworking with LTE and the other is for standalone.
  - Ericsson think we should first consider why we need these scenarios.
- => Noted

[R2-162618](#) Discussion on interworking scenarios between NR and LTE ZTE Corporation discussion

- Qualcomm think many of the options are not supported by SA2.
  - LG understand that scenario 1 are important as LTE is widely deployed. Don't understand why scenario 3 should be high priority.
  - DOCOMO understand that there is a case where the NR is served by EPC and NR although not simultaneously.
  - CMCC consider 3 and 5 as high priority.
  - Samsung understand that connecting NR to EPC was not part of SA2 scope. So deploying NR requires Ncore. Intel understand that Ncore might be an evolved EPC. NEC have the same understanding regarding SA2. From RAN perspective support interworking from EPC and NR.
  - Huawei think we should align to SA2 and consider NR connected to Ncore. Ericsson think this doesn't preclude that the Ncore is based on EPC.
  - Qualcomm think the core doesn't matter to us. What matters is whether is whether LTE or NR is the MCG.
  - IDC think this may impact our discussion on 1A for example as NR would have to connect to EPC.
  - ZTE think it was not decided in RAN that LTE must be the MeNB. For the user plane we don't see a reason not to connect NR and EPC. NEC have the same understanding.
- => Noted

[R2-162666](#) Scenarios for LTE-NR tight interworking Huawei, HiSilicon discussion

- Intel ask the reason for the non overlapped scenario. Huawei explain that the UE is connected to NR but traffic is routed via LTE eNB. LG wonder if the NR is not standalone how can the UE access the NR cell.
  - Ericsson think it would be good to have an annex in the TR for deployment scenarios.
- => We will capture in the TR deployment scenarios that we intend the system to support. Which scenarios to include (from this and other papers) is TBD. We will only capture different scenarios that are visible to us.

[R2-162364](#) Deployment Scenarios for Interworking Nokia, Alcatel-Lucent Shanghai Bell discussion

- Ericsson think we should not differentiate between Ncore and EPC.
  - MediaTek ask for scenario 2 and 4 whether the UE connects to both NR and LTE at the same time. Nokia explain it depends on the type of mobility to be supported.
  - Telecom Italia understand the LTE should be supported by the Ncore.
  - Huawei think that SA2 are not working on connection between EPC and Ncore and so scenario 2 is not a good starting point. Also NR can not connect to EPC so scenario 1 is not a good starting point.
  - Samsung understand that an interface between RATs is not needed for inter-RAT mobility.
- => Noted

- [R2-162730](#) Aggregation scenarios for NR Qualcomm Incorporated discussion
- Ericsson ask if WLAN is included in the SID. Qualcomm clarify that this is included in the RAN TR on requirements. Huawei understand the requirement is on WLAN interworking but may not require aggregation. Conviva think aggregation is not excluded. MediaTek have the same view as Conviva. Ericsson think all options may be in the table.
  - ZTE ask if NR/LTE/WLAN should be supported. Qualcomm don't see a real use case for this option. Huawei think today we don't support LWA and DC together.
  - Apple don't think that we should limit our study to LWA scenario.
  - Samsung support many of the things in the paper.
  - IDC ask if we have considered ideal backhaul aggregation between NR and LTE. Qualcomm think we may need to wait for RAN1.
- => Noted
- ✉ **[93#23][NR] Deployment scenarios (DOCOMO)**  
Aim to identify deployment scenarios that can be captured in the TR.  
Intended outcome: Email discussion report to next meeting  
Deadline: Thursday 05/05/2016

### Support of unlicensed

- [R2-162225](#) Support of Unlicensed Bands in 5G New Radio Interface Samsung Electronics Co., Ltd discussion
- LG is concerned about overlap between unlicensed uplink for eLAA and 5G in parallel.
  - DOCOMO has similar concerns as LG. At this time it is hard to study this for NR.
  - Apple think the proposal is ambitious and we should restrict ourselves.
  - Sprint think unlicensed is important. We should not reduce NR capability compared to LAA
  - Samsung think study of unlicensed standalone should be studied to make introduction easier. Apple think this could waste a lot of time. BlackBerry think the impact on RAN2 is not that clear today.
  - Huawei think this can't be decided in RAN2. Qualcomm, agree this is a potential thing to study. Intel think we should identify the scenarios of unlicensed and consider the protocol impact. The RAN2 impact is not so much. We can have further study of this.
  - CMCC think we should focus on licensed band first.
  - Ericsson think we need to be future compatible.
  - AT+T agree we should not reduce the capability as we move to NR.
- => Noted
- [R2-162750](#) High level discussion on supporting NR in unlicensed spectrum Ericsson discussion
- BlackBerry ask if the first proposal is to have 3 different flavours of the RAT or one RAT that is optimised for all cases. Ericsson think this is what needs to be studied.
  - Apple think the intent is to make it as efficient as possible in unlicensed.
  - Huawei think we will have to make a trade off during the work.
  - NEC ask if we need to study shared-licensed spectrum. Ericsson think if it works for unlicensed then it will work for shared-licensed spectrum. Apple is not sure the same mechanism will work.
- => Noted
- [R2-162751](#) Details on NR impact to support unlicensed operation Ericsson discussion
- Apple think it is good to investigate LBT. Also think it is too early to rule out RTS/CTS.
  - Intel think the impact of beams should be investigated in RAN1.
  - Huawei share the view of Intel and wonder if this paper has RAN2 impact.
  - MediaTek agree this is a problem with beamforming in unlicensed and it does impact RAN2.
  - Ericsson think we might have a shorter TTI for licensed and unlicensed but short TTI would not be restricted to unlicensed. Think the system should support variable TTI.
  - BlackBerry agree with the observation that short TTI is beneficial.
- => Noted
- [R2-162712](#) Support of unlicensed band in NR Intel Corporation discussion
- Samsung ask if scenario 3 is a CA case. Intel think it does not assume DC or CA. Samsung understand the word assistance to imply CA. Intel just intended it to mean that the unlicensed cell does not work in standalone.

- LG think that DC with unlicensed has never been studied before. If we want to study unlicensed then we must base our work on CA. Ericsson think we should not limit our work. We should study this. Huawei also think we should not limit to the CA case as we are considering a different RAT.
  - DOCOMO think from deployment point of view we can't exclude any option but in study we can look at the impacts.
  - Apple don't see how unlicensed DC would be better than aggregation with WLAN.
- => Noted

#### Support of high frequency

- [R2-162251](#) RAN2 aspects of high frequency New RAT Samsung Electronics Co., Ltd discussion
- MediaTek ask if beam RLM would be visible to the upper layers. Samsung think it might have some impact to upper layers, although beam tracking is mainly handled by L1.
  - LG think many observations are for RAN1 to discuss and we may need to wait. Also think that most impacts come from standalone. Samsung think the observations are not limited to standalone. LG think broadcasting for example is not so essential for non standalone.
  - DOCOMO think it would be good to have an understanding of whether HF standalone has to be supported. Samsung think that we should study this case.
  - Huawei think that to have a good study of beamforming we need a design from RAN1.
  - Samsung think that the RAN requirements TR does include the case of HF urban macro.
  - MediaTek think in RAN2 we need some abstraction of beams and we don't need to wait for RAN1 to complete. Samsung agree that RAN1 do need to decide if they will support system information and beamforming.
  - Ericsson think we need to work in parallel with RAN1 and that might need us to make some guesses at first. For system information we need to understand who will take the lead. Nokia agree.
- => Noted

#### RAN architecture

- [R2-162610](#) Clarification on the deployment of CU and DU ZTE Corporation discussion
- Ericsson think it is too early to talk about these splits. DT agree with Ericsson. Huawei have the same view that we need understanding of the protocols.
  - Telecom Italia think this is part of the overall work so needs to be considered.
  - Intel think we need to consider this in the protocol design. MediaTek understand that RAN3 is working on this.
  - Samsung think we can just do our work without considering potential split locations. And still it will be possible to do various splits in implementation.
  - Huawei think we should just define the protocols to meet the requirements. Then RAN3 can do their work. Telecom Italia think the SID makes it clear this is a joint RAN2/3 responsibility.
  - Qualcomm think if we know the split can occur then we should design protocols to be friendly to the split.
  - Nokia think that as part of the study we need to consider where the split options are. Convida agree with Qualcomm and Nokia.
- => Noted
- => Offline discussion on the way we approach the fronthaul split issue and protocol architecture design. (Telecom Italia)
- Samsung summarised the outcome of the offline. Seems to be some consensus to consider the split from the beginning and a way forward will be provided.

- [R2-162990](#) Way forward on function split analysis Telecom Italia

##### Agreements

- 1) RAN2 will identify the main radio interface protocol functions
- 2) RAN2 will decide the order/placement/grouping of functions in protocol layers

- [R2-162613](#) Clarification on the requirement for CP/UP separation ZTE Corporation discussion
- Huawei think this makes assumption that certain logical entities will be present.

- ZTE understand that CU-C and CU-U may not be co-located. ZTE understand that a CU-C and CU-U separation may have impact to our mobility procedures. IAESI understand this may have impact on measurements and report for scheduling data.
  - Qualcomm wonders whether the UE will actually see this separation. ZTE explain the intent is explain that the UP and CP anchor point changes may not occur at the same time.
  - Nokia think it will impact the UE only if we wish to optimise the handovers.
  - LG ask if the UE connects to multiple CU-U's. ZTE explain that this can happen for multiple verticals supported.
  - ZTE think optimisations will be needed to address the zero handover interruption requirements. Samsung think this requirement does not mean that zero interruption is required for all cases. Telecom Italia confirm this understanding and think that CP/UP separation is a requirement and should be taken into account in the protocol design.
- => Noted

[R2-162721](#)

Considerations on access architecture Nokia, Alcatel-Lucent Shanghai Bell discussion

- Nokia explain the initial view that a NR NB would have these functions.
  - LG ask if there is impact to the UE. Nokia explain this is shown from the network perspective.
  - DOCOMO think the architecture principles are based on the RAN requirements TR. There are some ambiguities in the RAN TR, for example whether some requirements are always required. For example for CP/UP separation requirements if functional separation or data separation.
  - Samsung ask if the inter-RAT mobility would be handled by RAN rather than CN. Nokia understand that it could be handled in RAN in some cases.
  - Ericsson as the reason to avoid reduce the CN signalling. Nokia think in some cases we can minimise the signalling to the CN. IAESI think it is important to take some of the CN roles into the RAN to support the large number of devices, and see separation between physical coverage and control coverage.
- => Noted

[R2-162783](#)

Multi-RAT RAN and CN Qualcomm Incorporated discussion

- Ericsson assume that we only need to define the individual RAT specific boxes.
  - Intel ask if we have an optimisation for the case that all the RATs are in the same node. Qualcomm think this would enable some optimisations for inter-RAT cases.
  - Qualcomm explain the WLAN box is mainly for the UP. May be a separate WLAN CP box.
- => Noted

[R2-162784](#)

Logical Architecture and Fronthaul Options of the New RAT Qualcomm Incorporated discussion

=> Noted

[R2-162573](#)

Overall radio protocol and NW architecture for NR NTT DOCOMO INC. discussion

- LG ask if DU can be connected to the CN directly. DOCOMO confirm the DU is never connected to the CN.
  - Qualcomm understand that the NR will never connect to the EPC. DOCOMO think it is important that RAN and CN development are independent and it will be cheaper to extend the EPC to the NR and the new CN can just be used for new services only available by the new CN.
  - Huawei think that NR connected to EPC is not covered in SA2 and will also have security impacts that will have to be discussed in SA3. Ericsson think we need to wait a bit to see what SA2 conclude. Nokia think we need to think about legacy EPC and also the Rel-14 EPC and think NR connection to EPC is not ruled out. DOCOMO think it may not be a purely legacy EPC but may be an evolved EPC but will not be a full blown New Core.
  - Intel ask if the NR and connect to EPC and New Core would the UE have to support both protocol stacks. Qualcomm agree with Intel's concern. Samsung support this view.
  - CMCC don't consider that NR connected to EPC will be a cheaper option.
  - LG ask if the NR to EPC connection is just for the UP. DOCOMO explain it is definitely UP but CP is not precluded.
- => Discuss offline whether we should discuss with SA2 at next meeting regarding the connection of NR to EPC (Samsung)

## General considerations on user plane

### R2-162749 Requirements on the NR user plane stack Ericsson discussion

- LG ask if a single stack can meet these requirements. Ericsson prefer a single configurable stack as in LTE.
  - Apple ask about the need for short TTI. Ericsson explain it is a trade off between latency and overhead and in some cases latency will be required.
  - Qualcomm support proposals 4 to 6.
  - Qualcomm think that UE processing needs to be considered in the design of L2. Intel agree with that.
- => Noted

### R2-162767 User Plane Layer 2 Function Requirements for NR Qualcomm Incorporated discussion

- Qualcomm explain that optional in the paper implies that it is configurable by the network. Qualcomm that segmentation may not be used for the highest data rates.
  - LG think that multiplexing may not be needed in all cases.
  - Apple think the contribution makes sense and for some used cases it makes sense not to use some of the functions.
  - Qualcomm explain that retransmissions referred to RLC and not HARQ.
  - Ericsson assume that residual error rate should be very low even for high data rates.
  - BlackBerry think segmentation was needed in all cases as there are variable block sizes in LTE. But this depends on what RAN1 decide regarding flexible TTIs. Qualcomm think that even for fixed TTIs we would propose not to have segmentation and the benefit is reduced processing.
- => Noted

### R2-162766 Connected Mode DRX Considerations for NR Qualcomm Incorporated, Sony discussion

- Ericsson think we have DTX in a way in LTE as eNB controls when the UE transmits. Also do not understand the benefit of service specific DRX, we just need to apply the most stringent DRX. Qualcomm think the DRX must be more dynamic how long the cycle is when DRX is activated.
  - Nokia wonders if even if we provide very dynamic DRX with short sleep times whether UEs will actually make use of these. But measurement requirements may be relaxed depending on DRX.
  - Samsung think all the UE transmission are under network control so wonders what DTX adds. The only think not under network control is PRACH and SR.
  - IDC can agree that we should do advanced power saving but too early to discuss solutions.
- => Noted

### R2-162861 5G user plane protocol design LG Electronics Inc. discussion

- Nokia think that combining into a single layer will make fronthaul split difficult. Also ask how services are multiplexed. LG think that each UL grant is used for a single radio bearer. So services are multiplexed in time.
  - Panasonic think that removing multiplexing will increase PDCCH overhead. Huawei share the same concern and also affect efficiency.
  - Intel ask how this will work with 3C architecture. LG think for 3C there will need to be a split of some functions.
  - Qualcomm think it is good to study the single sequence number. MediaTek think that single sequence number will affect the split options and think it is not a big issue for big data.
  - ZTE think that multiplexing is required for beamforming. Samsung also support this view as for beamforming it is important to get as much data sent in a single opportunity.
  - Fujitsu see some benefits in the no multiplexing that can be discussed.
  - Samsung do not see how a single layer 2 entity can work with multiple logical channels. LG see it will be fully separated per flow but there will also be some common control functions.
- => Noted

### R2-162893 UE battery saving for diverse service LG Electronics Inc. discussion

- MediaTek ask if the UE would receive a DRX configuration for each service. LG explain this is the intent and similar to SC-PTM
- Huawei ask if this is per bearer?. LG confirm it is per bearer.

- Ericsson think if the UE is awake then it is awake and hence it would be ready to receive any service. Nokia thinks there is one radio interface so maybe this is just a signalling optimisation. Apple thinks this may cause the UE to wake up more.
- => Noted

#### General considerations on control plane

- [R2-162633](#) NR Control Plane protocol stack considerations from key performance indicators perspective  
Nokia, Alcatel-Lucent Shanghai Bell discussion
- DOCOMO see this is very consistent with the RAN requirements TR.
  - BlackBerry asks if we assume there will be data over control plane in the new RAT, as added to LTE. SierraWireless support the principles, specifically for the MTC use case.
  - DOCOMO think that the NR must be able to support very low bit rates and it doesn't matter whether it is provided over CP or UP and it is too early to conclude.
  - BlackBerry think it would be good to have a clear target at the start whether CP will carry data.
- => Noted

Moved from 9.3.3 to 9.2

- [R2-162300](#) Preliminary view on Initial Access in 5G Samsung discussion  
late
- Panasonic as if paging configuration is part of essential system information. Samsung think this still needs investigation.
  - DOCOMO think it is a good starting point. Network should be able to provide a single common system info for all services.
  - Ericsson is cautious with proposal 3 as if it is hard coded it is difficult to remove.
  - Nokia wonders about functionality such as SIB for inter-RAT mobility to idle mode.
  - Qualcomm think we need to decide what is considered the essential system information.
  - Samsung think that Inter-RAT mobility info may need to be broadcast.
  - LG think the principle is similar to LTE but adds the on demand request, and think it is worth to study this.
  - CATT share the view of both broadcast and on demand system info, but proposal 1 depends on RAN1.
  - Samsung clarify that they do see system information being sent by beamforming. For the on demand system information then there would be some kind of temporary connection for this.
- => Noted

- [R2-162763](#) Initial considerations on NR system access Ericsson discussion
- Qualcomm think it is an important aspect to consider how often the network transmits PSS/SSS. This has a significant impact on UE battery life.
  - Huawei ask if the intent to have a common procedure for low and high frequency. Ericsson would prefer a common procedure. Huawei think this might mean that the low frequency procedure might need to consider beam sweeping that might not really be needed.
  - DOCOMO think we should aim for a common approach and then see if differences are found necessary. Samsung also prefer to have a single approach.
  - Ericsson also think that information may not be provided on the frequency layer where it is needed to be used.
- => Noted

- [R2-162367](#) Efficient small data transmission Nokia, Alcatel-Lucent Shanghai Bell discussion
- MediaTek agree that supporting small data is key to deciding the states. Nokia that some papers are discussing the states first instead of considering the requirements.
  - LG think this is an important requirement but think it does not affect the RRC states.
  - MediaTek think for small data the UE power consumption is critical and LTE connected doesn't provide a good solution for power consumption.
  - LG think that small data transmission may be possible in RRC idle.
  - CMCC think it is important to consider the requirement first.
  - Huawei think it is an important requirement to consider.

=> Noted

Moved from 9.5.3 to 9.2

[R2-162742](#) RRC states for NR Qualcomm Incorporated, Sony discussion

- It seems RAN3 are considering RRC states.
- Ericsson think it can be transparent to the UE whether paging comes from CN or RAN. Samsung think the overall concept for RRC states really needs to be discussed in RAN2.
- Huawei thin the intention is good but we should be careful not to add too many more states. MediaTek wonder if current LTE states could be used to provide the objectives.
- LG think we need to be care to add more states beyond the LTE baseline. Only if it is beneficial should we consider it.
- Qualcomm think the functionality within RRC connected is important but are not saying new states are needed, could be different configurations.
- DOCOMO wonder if there are different use cases and this new approach is mainly for MTC uses cases. For MBB then current LTE might be sufficient.
- CMCC think we need to have a common understanding of the current states. CMCC think the current situation if idle and connected, and context cache is a substate of RRC idle, We need to first think of functions.
- BlackBerry can see that a separate state may be needed for MTC and wonder if we have it for one case then we would have it for other states.
- Panasonic suggest we wait for the light connection for LTE to finish.

=> Noted

[R2-162760](#) Handling of inactive UEs Ericsson discussion

[R2-162729](#) UE states MediaTek Inc. discussion

Above 2 Tdocs not treated

### Latency considerations

[R2-162752](#) Latency in NR Ericsson discussion

- LG ask if flexible TTI will impact L2 operation. Ericsson think we need to investigate this.
- BlackBerry thinks proposal 2 looks like WLAN, and may not be appropriate for licensed spectrum. Ericsson think we should avoid the the fundamental aspects of LTE that make very low latency difficult.
- Huawei ask what RAN 2 can do for low grant to transmission delay. Ericsson think we can look at multiplexing etc

=> Noted

[R2-162412](#) Latency of New Radio Access MediaTek Inc. discussion

=> Noted

[R2-162419](#) Consideration on Control Plane latency China Mobile Com. Corporation discussion

[R2-162616](#) Clarification on the requirement for mobility interruption time ZTE Corporation discussion

Above 2 Tdocs not treated

### Energy Efficiency

[R2-162508](#) Energy Efficiency Enhancement for 5G Samsung Electronics Co, LTD discussion

- Nokia think the TR has a requirement but it is not quantitative. For 5G if we want to do something serious we need some numeric requirements.
- Ericsson is in general ok with these proposals.
- Huawei ask if this is from the network or UE side. The goals of the UE and network are not well aligned. Samsung explain that both need to be considered.
- MediaTek think some power efficiency also comes from beamforming.
- CMCC think we need to consider these requirements seriously.
- Nokia think we have had some SIs on this topic and that came to nothing. We should keep these requirements in mind but most of the issue is addressed by implementations. Samsung agree that implementations are important but for beamforming we need to consider some enhancements

=> Noted

[R2-162764](#) NR Network Energy Performance Ericsson discussion  
Not treated

#### Other

[R2-162920](#) Discussions on 5G mMTC Samsung Electronics discussion  
[R2-162940](#) NR use cases and scenarios, design targets LG Electronics Inc. discussion  
[R2-162418](#) Learning from LTE China Mobile Com. Corporation discussion  
[R2-162230](#) Network graphs supporting for central coordination as 5G design target IAESI, Fairspectrum discussion  
Above 4 Tdocs not treated

## 9.3 Tight interworking between NR and LTE

### 9.3.1 Overall architecture

E.g. build on LTE dual connectivity architecture for NR and LTE, other options, etc

[R2-162365](#) Dual connectivity between LTE and the New RAT Nokia, Alcatel-Lucent Shanghai Bell discussion

- Huawei think we need to capture the deployment scenarios first.
- ZTE have similar thinking and support the proposal.
- Ericsson think also the NR node should be able to be the MeNB.
- Intel think the proposal 2 is reasonable.

=> Noted

[R2-162707](#) NR architectural discussion for tight integration Intel Corporation discussion

- Samsung think it is a good principle that LTE MeNB and NR eNB do not need to understand each others signalling. Ericsson think the main reason for this in LTE was for capability and we will still need to address this issue. Intel think if we go for a transparent model we will have to engineer it to work. Qualcomm think the UE will have a common RF and expect coordination.
- Samsung think there should be coordination for the capabilities but they should not understand each others RRC configuration.
- Huawei agree there should be coordination but how to do this on network side needs more discussion. Intel think it can be made to work.
- ZTE support the principle suggested by Samsung.

=> Noted

[R2-162536](#) Discussion on DC between NR and LTE CMCC discussion

- Nokia think it is fine to minimise changes but we cannot avoid changes. And this is more like to need more changes than just inter-RAT mobility. Ericsson agree with Nokia.
- CMCC would like to deploy NR as low frequency with full coverage and would like to use LTE eNB as SeNB.

=> Noted

[R2-162615](#) RAN interworking between NR and LTE KT Corporation discussion  
=> Revised in [R2-162965](#)

[R2-162965](#) RAN interworking between NR and LTE KT Corporation discussion

- Qualcomm ask how 5G RRC is integrity protected. KT explain that it is protected by LTE PDCP. KT clarify that the NR RRC would be carried by LTE DRB not SRB.
- Samsung think this is a realistic deployment model for early phase.
- Huawei ask if the UE will have 2 RRC entities one for NR and one for LTE. KT explain this is the intention.
- LG suggest the NR RRC could be connected to LTE RRC so that LTE RRC could carry the NR RRC message. KT explain the intent to minimise the impact to LTE RRC.

=> Noted

[R2-162207](#) 5G Radio Protocol Architecture Samsung R&D Institute UK discussion

- [R2-162231](#) High level view of 5G access architecture IAESI, Thales, Fairspectrum discussion  
[R2-162413](#) Tight interaction between NR and LTE MediaTek Inc. discussion  
[R2-162480](#) Discussion on tight interworking between NR and LTE ITRI discussion  
[R2-162566](#) Interworking between LTE and 5G NR CATT other  
[R2-162619](#) Consideration on radio aggregation between NR and LTE ZTE Corporation discussion  
[R2-162786](#) Architecture-related Aspects for Interworking between NR and LTE INTERDIGITAL COMMUNICATIONS discussion  
[R2-162889](#) Tight interworking between NR and LTENEC discussion  
[R2-162933](#) UP overall architecture for tight interworking between NR and LTE LG Electronics Inc. discussion  
Above 9 Tdocs not treated

### 9.3.2 User plane aspects

E.g. user plane protocol architecture for bearers carried via NR. Common aspects to be discussed in agenda item 9.4.2

- [R2-162710](#) User plane architectural choices for LTE-NR interworking Intel Corporation discussion
- Huawei think we first need to confirm if the backhaul is the same as release 12 small cell study.
  - DOCOMO agree with Huawei but we didn't discuss ideal backhaul for DC in Release 12. For tight interworking we might like to consider DC with an ideal backhaul.
  - MediaTek would like to confirm that for tight interworking there will be only 1 S1 termination on the CN side.
  - CATT ask if use of interworking is mainly for MBB use case is the common understanding. Samsung understand that it is mainly for eMBB. Ericsson assume MTC is not an intended use case but think URLLC might be. Qualcomm share the Ericsson view. Samsung think URLLC might be possible if there is no power issue. Nokia agree with Ericsson.
  - Telecom Italia think the most likely use case is eMBB.
- => Noted
- [R2-162754](#) Tight integration of the New Radio interface (NR) and LTE: User Plane design Ericsson discussion
- Samsung ask if LTE and NR will use the same security algorithm. Ericsson assume a single PDCP.
  - Huawei ask if this means we will always PDCP for NR. Ericsson confirm.
  - IDC think for tight interworking it makes sense to use LTE PDCP but wonder if LTE PDCP would also be used for NR standalone. Ericsson think this may depend.
  - Huawei think LTE PDCP for NR is a good starting point for our work.
  - Qualcomm think we need to be careful as it impacts the rest of the UP design. And think we can not achieve 5G throughput with legacy PDCP. CMCC agree with Qualcomm. Samsung also have the same view.
- => Noted
- [R2-162603](#) Discussion on the user plane for the tight interworking between NR and LTE ZTE Corporation discussion
- MediaTek is not sure PDCP retransmission is a good solution to address the blockage at high frequency. Ericsson think this was discussed for LAA and discarded. LG think we discussed RLC autonomous retransmission for LAA.
  - ZTE is not sure that RRM measurements can help for example in the case of a blockage at 70MHz.
- => Noted
- [R2-162298](#) On the need of new DRB types in 5G Samsung discussion  
[R2-162862](#) New RB configurations in 5G LG Electronics Inc. discussion  
[R2-162567](#) Multiple connection for transmission reliability CATT other  
[R2-162827](#) User-Plane Aspects for Interworking between NR and LTE INTERDIGITAL COMMUNICATIONS discussion  
Above 4 Tdocs not treated

### 9.3.3 Control plane aspects

E.g. configuration and control of NR operation, relation to LTE RRC, mobility considerations specific to tight interworking, etc

[R2-162691](#) NR Control Plane protocol stack considerations from requirements for architecture and migration of NG Radio Access technologies Nokia, Alcatel-Lucent Shanghai Bell discussion  
- LG ask if P4 means the UE has multiple RRC entities. Nokia explain this is not the intent.  
=> Noted

[R2-162753](#) Tight integration of the New Radio interface (NR) and LTE: Control Plane design Ericsson discussion  
- DOCOMO wonder if we can now start to evaluate RRC diversity and RRC dual architecture. Qualcomm agree but think that dual RRC would require us consider standalone from the start. Nokia think that we should not prioritise. Qualcomm clarify that dual RRC should be considered as part of standalone but not part of the tight interworking.  
- LG think dual RRC was already studied and we decided on a single RRC and think we should not discuss again. But for RRC diversity we can consider that for NR.  
- Samsung think the dual / single RRC is a very small difference.  
- Panasonic wonder if the diversity is temporary. Ericsson think that it is not limited.  
- LG think that for interworking it is good to limit the RRC functionality in NR.  
- IDC think we need to consider the functionality of the RRC are needed for NR in the tight interworking case and then we can consider the transport. Huawei agree with IDC.  
=> Noted

[R2-162711](#) Control plane aspects for LTE-NR interworking Intel Corporation discussion

[R2-162621](#) Discussion on control plane for the DC based LTE NR tight interworking ZTE Corporation discussion

[R2-162785](#) Control Plane Aspects for Interworking between NR and LTE INTERDIGITAL COMMUNICATIONS discussion

[R2-162942](#) CP aspects in tight interworking LG Electronics Inc. discussion  
Above 4 Tdocs not treated

### 9.3.4 Other

No contribution received.

## 9.4 Standalone NR operation

### 9.4.1 Impact of new CN

Closely related to ongoing work in SA2. Aspects that may be covered include RAN impacting key issues in SA2 TR 23.799, e.g. AS/NAS functional split, mobility framework, QoS architecture, security etc

#### Mobility related

[R2-162228](#) Inter-RAT mobility with LTE Samsung R&D Institute UK discussion  
- Intel think this is one of our questions for SA2 and we could consider it after we have discussed with them.  
- Ericsson wonder if the tight interworking enables inter-RAT mobility. Samsung think we have never requires such network internal interface to support inter-RAT handover.  
- Nokia agree that S1 based HO should be the basis but do not rule out and X2 based approach.  
- Intel think the question is whether the interface for tight interworking is extended to support handover. Huawei think it will depend on which core is used and why SA2 need to be involved. Nokia think it should be possible to use the interface to meet latency requirements.  
=> Noted

[R2-162421](#) Interface consideration for tight LTE/NR interworking anchored to NextGen Core Nokia, Alcatel-Lucent Shanghai Bell discussion

=> Noted

- [R2-162705](#) Standalone NR: RAN based mobility framework Intel Corporation discussion
- LG think we need to clarify the benefit of introducing new states related to mobility and activity.
- => Noted

#### QoS related

- [R2-162622](#) Discussion on the QoS control in the NextGen RAN ZTE Corporation discussion
- LG want to keep the same EPS bearer concept but modify to support multiple flows and QoS per bearer.
  - ZTE think that today the CN decide whether to create a new bearer but this approach moves this to the RAN to decide whether to create new radio bearers.
  - Nokia think that regardless of what SA2 decide we will need to keep logical channels.
  - Qualcomm support these proposals.
  - MediaTek ask if the eNB will need to know the flow specific information. ZTE think the CN will indicate some information to the eNB for this purpose.
  - Nokia think our starting point should be what we want to do.
  - Ericsson think that SA2 are discussing this and we in RAN2 can discuss how we realise the QoS treatment if they agree to do this. We think we should keep the model of separate queues for priority.
  - LG think we might need some mechanism to differentiate IP flows in a single EPS bearer and provide the QoS treatment.
  - Intel's thinking was quite similar but the difference that RBs are not so static but can be dynamically created as needed.
  - Huawei think that if SA2 keep EPS bearer then we will not need more discussion in RAN2 on per flow QoS.
  - Nokia think making something dynamic is ok until you start to consider GBR.
  - Motorola Solutions think that service granularity and QoS granularity must be supported in NR.
- => Noted

- [R2-162704](#) Use of bearers and QoS support in NR Intel Corporation discussion

- [R2-162898](#) QoS framework in 5G New RAT LG Electronics Inc. discussion

Above 2 Tdocs not treated

## 9.4.2 Addressing verticals

How NR design can address requirements of different verticals such as URLLC, massive MTC, etc in addition to eMBB.

- [R2-162662](#) Low latency and low overhead transmission for NR Huawei, HiSilicon discussion
- Nokia don't think the processing delays will scale with the TTI duration. It would be better to use the NR processing delay but we don't know that.
  - Huawei clarify that it is not proposing whether the data transfer is in idle or connected.
- => Noted

- [R2-162227](#) Discussion on Study Areas for URLLC in 5G New Radio Interface Samsung discussion
- Samsung think this is highly dependent on RAN1. Samsung think we need to wait for some agreement from RAN1 but we should get feedback soon
- => Noted

- [R2-162243](#) Multiplexing of vertical services in New RAT Samsung Electronics Co., Ltd discussion
- [R2-162706](#) Standalone NR: supporting verticals and forward compatibility Intel Corporation discussion
- Above 2 Tdocs not treated

- [R2-162787](#) Emerging Vehicular Communication Applications HUAWEI, HiSilicon discussion
- LG think that SA1 is still discussing the support of V2X and think we need to wait for SA1 progress, but ok to investigate support for this.
  - Huawei think this is beyond what we consider to be V2X.
- => Noted

### 9.4.3 Protocol architecture

Including protocol architecture, protocol functionalities, mobility considerations specific to standalone operation, etc

[R2-162420](#) NR User Plane protocol stack considerations Nokia, Alcatel-Lucent Shanghai Bell discussion  
=> Noted

[R2-162607](#) Flexible UP architecture for NR access technology MediaTek Inc. discussion  
revision of [R2-162502](#)

- Ericsson ask if the protocol layers should be able to move to different nodes. MediaTek explain that it could be semistatically configured where the protocol resides. ZTE ask if this if from network or UE point of view. MediaTek explain it is from network point of view. The aim is to cater for the different requirements of the services.
- Qualcomm think that this should be transparent to UE.
- DOCOMO ask what is the benefit to change the split from the network point of view. MediaTek think that once the bearer is set up based on the requirements of the service then it will not change dynamically. DOCOMO think it is not so clear how the split can help to address the requirements of the service. Ericsson think the split depends on the architecture and that does not change.

=> Noted

[R2-162660](#) Flexible air interface of NR Huawei, HiSilicon discussion

[R2-162759](#) Handling on different services Ericsson discussion  
Above 2 Tdocs not treated

[R2-162703](#) RRC in standalone NR Intel Corporation discussion

- NEC wonder if network slicing will impact protocol design. Intel think one aspect is connectivity to multiple core networks.
- DOCOMO ask if the intent is to limit the RRC functions and not include SON, MDT etc. Intel explain there is not the intent to limit.

=> Noted

[R2-162215](#) System Information Signalling in NR Samsung Electronics Co., Ltd discussion

- Qualcomm share the view about proposal 1, bt for proposal 2 not sure if LTE MTC designed is a good starting point. CONvida have a similar view.
- LG think both proposals are fine and think we will need to discuss more a separate design for beamforming case and non beamforming case.
- Samsung explain that the proposal was not eant to be beamforming specific but it was used as an example.

=> Noted

[R2-162216](#) Secured Transmission of System Information in NR Samsung Electronics Co., Ltd discussion

- LG think we do not have any issue in LTE or UMTS so why is this needed. Samsung think it is not protected and so this could be addressed in the NR.
- Huawei think that SA3 should be responsible to decide if this is a problem.
- Qualcomm think the current system has enough protection. It is not possible to transfer user data via a rogue base station. This kind of approach will have big system changes and don't see much use to study it.
- Panasonic think that the UE could be listening for paging in a rogue cell and the paging will never be received. Samsung explain this is the use case.
- Ericsson agree with Samsung that there might be issues but it should be up to SA3.
- Nokia wonder why an attacker would do this and also wonder if there is anyway to fix this.
- Huawei think public key infrastructure is a very hard problem.

=> Noted

[R2-162629](#) Consideration system information broadcast in NR ZTE Corporation discussion

[R2-162657](#) General considerations on mobility in NR Huawei, HiSilicon discussion

[R2-162241](#) Radio Bearer Handling and Challenges for 5G Fujitsu discussion

[R2-162623](#) Discussion on the protocol architecture for standalone NR ZTE Corporation discussion

[R2-162718](#) Consideration on the relation between UE and cell discussion China Mobile Com. Corporation

[R2-162941](#) CP aspects in standalone NR LG Electronics France discussion  
Above 6 Tdocs not treated

**Withdrawn:**

[R2-162502](#) Flexible UP architecture for NR access technology MediaTek Inc. discussion

#### 9.4.4 Other

[R2-162208](#) Idle Mode Design for 5G RAT Samsung R&D Institute UK discussion

[R2-162299](#) Co-existence scenarios for LTE and 5G Samsung discussion

[R2-162568](#) Consideration on higher layer procedures in 5G NR CATT other

[R2-162620](#) QoS related enhancements for NR access technology MediaTek Inc. discussion  
Above 4 Tdocs not treated

## 9.5 Common aspects for standalone and tight interworking with LTE

Aspects that may be common to tight interworking with LTE and standalone NR operation. Including discussion of which parts of the new RAT design should be common.

### 9.5.1 RAN architecture impacts

Addressing the radio interface impacts of potential new RAN architectures for the NR. E.g: considering different front haul split options, network slicing, etc

[R2-162757](#) NR deployment scenarios Ericsson discussion

[R2-162765](#) CN/RAN aspects of NR integration Ericsson discussion  
Above 2 Tdocs not treated

#### Front haul split

[R2-162229](#) Function split between central and remote node (fronthaul) Samsung R&D Institute UK discussion

[R2-162713](#) Fronthaul and RAN functional split aspects of the NR radio access network Intel Corporation discussion

[R2-162756](#) RAN internal architecture Ericsson discussion

[R2-162570](#) Analysis on front haul split options CATT other

[R2-162604](#) Discussion on different NR RAN Splitting options KT Corporation discussion

[R2-162611](#) NR RAN architecture and interface for MVI KT Corporation discussion

=> Revised in [R2-162964](#)

[R2-162964](#) NR RAN architecture and interface for MVI KT Corporation discussion

[R2-162624](#) Discussion on the function split between CU and DU ZTE Corporation discussion

[R2-162625](#) The capacity requirement for the interface between CU and DU ZTE Corporation discussion

[R2-162826](#) Fronthauling with New Radio Technology INTERDIGITAL COMMUNICATIONS discussion

[R2-162890](#) RAN architecture impact due to different functional split options NEC discussion

[R2-162951](#) Consideration on RAN logical Architecture Huawei, HiSilicon discussion

Above 12 Tdocs not treated

#### Network slicing

[R2-162664](#) Network slicing considerations Huawei, HiSilicon discussion

- Nokia ask if a slice is linked to UE category or to the services that the UE uses. Huawei think SA2 are looking at it from service point of view. In RAN we would like to understand if we have different radio capabilities and resources for different slices.
- Samsung ask if different RBs in the RAN is enough to handle different slices or whether more is needed.
- Huawei assume a single common RAN can support multiple network slices. Assume there are common functions such as scheduler reside in the RAN.

- Qualcomm think that a common RAN with CN slice selection is the starting point. Nokia also think that slicing should not impact radio too much, but the details will be very complex.
  - Huawei think SA2 are considering is different slices might share a single control plane.
- => Noted

[R2-162891](#) RAN architecture impact due to Network Slicing NEC discussion  
[R2-162758](#) RAN support for network slicing Ericsson discussion  
[R2-162443](#) The impact of network slicing on RAN Samsungother  
[R2-162569](#) Network slicing in 5G NR CATT other  
[R2-162627](#) Consideration on RAN side Network slicing ZTE Corporation discussion  
Above 5 Tdocs not treated

#### Other

[R2-162897](#) Initial thought on NR Network Node LG Electronics Inc. discussion  
Not treated

## 9.5.2 Common protocol architecture

Addressing protocol architecture of and protocol functionalities of the layers that may be common for common for standalone and tight interworking with LTE, e.g. MAC, RLC

[R2-162209](#) 5G User Plane radio protocol overview Samsung R&D Institute UK discussion  
[R2-162708](#) MAC aspects for NR Intel Corporation discussion  
[R2-162863](#) Fast Uplink Channel LG Electronics Inc. discussion  
Above 3 Tdocs not treated

#### Withdrawn:

[R2-162663](#) Network slicing considerations Huawei, HiSilicon discussion

## 9.5.3 Mobility considerations

Including implications of high frequency operation, multiple transmission points, etc.

[R2-162210](#) Beam level management <-> Cell level mobility Samsung R&D Institute UK discussion

- Nokia agree that 2 levels are needed and that beam management should be transparent to RRC but may need to be visible to MAC. CATT ask if the beam mobility is transparent to the eNB. Samsung assume that it is not.
- Samsung clarify that a node could still have more than one cell. The intent is that we still handle cell and beams as we did for comp scenario 4.
- Huawei think that we could send an LS to RAN1 regarding their responsibility to handle beam mobility. Samsung think today that RRC is still frequently involved in configuration of physical layer parameters for this.
- Ericsson is ok with having 2 levels of mobility but is not sure about the terminology and we might want to avoid the term cell.
- Qualcomm think in the same way.
- LG is reluctant to consider beam level management to be considered as mobility.
- Samsung explain that somehow each TRP must ensure that paging and sys info is provided over its coverage.

=> Noted

[R2-162709](#) Beam support in 5G NR Intel Corporation discussion  
[R2-162762](#) Active Mode Mobility in NR: SINR drops in higher frequencies Ericsson discussion  
[R2-162246](#) Mobility performance of high frequency New RAT Samsung Electronics Co., Ltd discussion  
[R2-162628](#) Consideration on the mobility in NR ZTE Corporation discussion  
[R2-162761](#) Active Mode Mobility in NR: future proofness and energy efficiency Ericsson discussion  
[R2-162226](#) Discussion on Beam Measurement and Tracking for 5G New Radio Interface in mmWave Frequency Bands Samsung discussion  
[R2-162366](#) Beamforming Impacts Nokia, Alcatel-Lucent Shanghai Bell discussion  
Moved from 9.6 to 9.5.3

[R2-162445](#) Radio link problem detection in mmW systems Samsungother  
[R2-162498](#) Clarification on mobility interruption time China Mobile Com. Corporation discussion  
[R2-162571](#) Introduction of virtual cell CATT other

[R2-162755](#) Multi-connectivity within NR Ericsson discussion  
[R2-162885](#) Mobility Considerations for Next Generation System ETRI discussion  
Above 12 Tdocs not treated

#### 9.5.4 Other

[R2-162308](#) RRC specification for 5G Samsung Telecommunications discussion  
Not treated

#### 9.6 Other

No contributions received.

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## 10 UTRA Release 11 and earlier releases

[R2-162956](#) Support of DB-DC-HSUPA Qualcomm Incorporated draftCR 25.306 11.10.0 - - F  
Rel-11 HSUPA\_DB\_MC-Core  
for replacing withdrawn CR in [R2-162915](#)  
=> Change category to B and merge rows in capability table  
=> Update title to Introduction of DB-DC-HSUPA in earlier release and “Croatia”  
=> Keep support “for” to be consistent with Rel-13  
=> From now on new capabilities should adapt the terminology support “of”  
=> The CR is agreed in principle with the changes above in [R2-162981](#)

[R2-162957](#) Support of DB-DC-HSUPA Qualcomm Incorporated draftCR 25.306 12.7.0- - A  
Rel-12 HSUPA\_DB\_MC-Core  
for replacing withdrawn CR in [R2-162917](#)  
*moved from AI 11*  
=> adapt all changes above  
=> The CR is agreed in principle with the changes above in [R2-162982](#)

[R2-162958](#) Support of DB-DC-HSUPA Qualcomm Incorporated draftCR 25.331 11.16.0 - - F  
Rel-11 HSUPA\_DB\_MC-Core  
for replacing withdrawn CR in [R2-162930](#)  
- Ericsson indicates that when there are multiple capabilities different names has to be given (dummy1, 2, etc)  
=> The CR is postponed

[R2-162959](#) Support of DB-DC-HSUPA Qualcomm Incorporated draftCR 25.331 12.9.0- - A  
Rel-12 HSUPA\_DB\_MC-Core  
for replacing withdrawn CR in [R2-162931](#)  
*moved from AI 11*  
=> The CR is postponed

[R2-162960](#) Support of DB-DC-HSUPA Qualcomm Incorporated draftCR 25.331 13.2.0- - A  
Rel-13 HSUPA\_DB\_MC-Core  
for replacing withdrawn CR in [R2-162932](#)  
*moved from AI 12.9*  
- Ericsson doesn't think a CR is needed as we already have a Rel-13 capability. Nokia Net has the same understanding. This would imply different handling in the network side based on release of UE  
=> The Rel-13 capability is ported and all capabilities are dymmified  
=> The CR is not pursued

#### Withdrawn:

[R2-162653](#) Clarification for UE behaviour upon reception of requested E-UTRA frequency band list  
Nokia, Alcatel-Lucent Shanghai Bell CR 25.331 10.19.0 5854 - F Rel-10  
TEI10

[R2-162654](#) Clarification for UE behaviour upon reception of requested E-UTRA frequency band list  
Nokia, Alcatel-Lucent Shanghai Bell CR 25.331 10.19.0 5855 - F Rel-10  
TEI10

|                           |                                              |    |        |            |      |   |   |
|---------------------------|----------------------------------------------|----|--------|------------|------|---|---|
| <a href="#">R2-162915</a> | Support of DB-DC-HSUPA Qualcomm Incorporated | CR | 25.306 | 11.10.0    | 0505 | - | B |
|                           | Rel-11 HSUPA_DB_MC-Core                      |    |        |            |      |   |   |
| <a href="#">R2-162917</a> | Support of DB-DC-HSUPA Qualcomm Incorporated | CR | 25.306 | 12.7.00506 | -    | B |   |
|                           | Rel-12 HSUPA_DB_MC-Core                      |    |        |            |      |   |   |
|                           | <i>moved from AI 11</i>                      |    |        |            |      |   |   |
| <a href="#">R2-162930</a> | Support of DB-DC-HSUPA Qualcomm Incorporated | CR | 25.331 | 11.16.0    | 5856 | - | B |
|                           | Rel-11 HSUPA_DB_MC-Core                      |    |        |            |      |   |   |
| <a href="#">R2-162931</a> | Support of DB-DC-HSUPA Qualcomm Incorporated | CR | 25.331 | 12.9.05857 | -    | B |   |
|                           | Rel-12 HSUPA_DB_MC-Core                      |    |        |            |      |   |   |
|                           | <i>moved from AI 11</i>                      |    |        |            |      |   |   |
| <a href="#">R2-162932</a> | Support of DB-DC-HSUPA Qualcomm Incorporated | CR | 25.331 | 13.2.05858 | -    | F |   |
|                           | Rel-13 HSUPA_DB_MC-Core                      |    |        |            |      |   |   |
|                           | <i>moved from AI 12.9</i>                    |    |        |            |      |   |   |

## 11 UTRA Release 12

(EDCH\_enh-Core, leading WG: RAN2, REL-12, started: Dec. 13, **closed**: Dec. 14, WID: [RP-140127](#))

(UTRA\_SIBenh-Core, leading WG: RAN2, started: Dec. 13, **closed**: Sep 14, WID: [RP-140131](#))

(UTRA\_hetnet\_enh-Core, leading WG: RAN1, started: Dec.13, **closed**: Sep. 14, [RP-140463](#))

(UTRA\_DCHenh-Core, leading WG: RAN1, started: Sept.13, **closed**: Sep. 14, [RP-131357](#))

(UTRA\_LTE\_WLAN\_interw-Core, leading WG: RAN2, REL-12, started: Dec.13, **closed**: Sep. 14, WID: [RP-132101](#))

(LTE\_UTRA\_IncMon-Core, leading: RAN4, REL-12, started: Dec.13, **closed**: Dec. 14, WID: [RP-132061](#))

Input to any other Rel-12 WI/SI not explicitly listed above.

(UTRA\_hetnet\_mob-Core, leading WG: RAN2, Started: Dec.13, closed: June 14, WID: [RP-140463](#))

(LCS\_BDS-UTRA-Core, leading WG: RAN2, started: March 13, closed: Dec.13, WID: [RP-130416](#))

(EHNB\_enh3-Core, leading WG: RAN3, REL-12, started: Sep.12, closed: Dec 13, WID: [RP-130741](#))

(LCR\_TDD\_HSPA\_sign\_enh-Core, leading WG: RAN1, started: Dec 12, closed: Dec 13, WID: [RP-121984](#))

(LTE\_UTRA\_SDL\_BandL-Core, leading WG: RAN4, started: June 13, closed: June 14, WID: [RP-140092](#))

Including corrections for UTRA functionality introduced as TEI12.

|                           |                                               |                   |         |        |         |
|---------------------------|-----------------------------------------------|-------------------|---------|--------|---------|
| <a href="#">R2-162500</a> | Correction on the naming E-DCH decoupling     | Huawei, HiSilicon | draftCR | 25.308 | 12.2.0- |
|                           | - D Rel-12 UTRA_HetNet_enh-Core               |                   |         |        |         |
|                           | NOTE: CR category should be F                 |                   |         |        |         |
|                           | => Change category to F and start from Rel-13 |                   |         |        |         |
|                           | => The CR is not pursued                      |                   |         |        |         |
| <a href="#">R2-162373</a> | Correction on the naming E-DCH decoupling     | Huawei, HiSilicon | draftCR | 25.308 | 13.1.0- |
|                           | - A Rel-13 UTRA_HetNet_enh-Core               |                   |         |        |         |
|                           | => Change category to F                       |                   |         |        |         |
|                           | => CR is agreed in principle                  |                   |         |        |         |
| <a href="#">R2-162501</a> | Correction on the naming E-DCH decoupling     | Huawei, HiSilicon | draftCR | 25.319 | 12.3.0- |
|                           | - D Rel-12 UTRA_HetNet_enh-Core               |                   |         |        |         |
|                           | NOTE: CR category should be F                 |                   |         |        |         |
|                           | => Not treated                                |                   |         |        |         |
| <a href="#">R2-162375</a> | Correction on the naming E-DCH decoupling     | Huawei, HiSilicon | draftCR | 25.319 | 13.0.0- |
|                           | - A Rel-13 UTRA_HetNet_enh-Core               |                   |         |        |         |
|                           | => Change category to F                       |                   |         |        |         |
|                           | => The CR is agreed in principle              |                   |         |        |         |
| <a href="#">R2-162503</a> | Correction on the naming E-DCH decoupling     | Huawei, HiSilicon | draftCR | 25.331 | 12.9.0- |
|                           | - D Rel-12 UTRA_HetNet_enh-Core               |                   |         |        |         |
|                           | NOTE: CR category should be F                 |                   |         |        |         |
|                           | => Not treated                                |                   |         |        |         |

- [R2-162376](#) Correction on the naming E-DCH decoupling Huawei, HiSilicon draftCR 25.331 13.2.0-  
- A Rel-13 UTRA\_HetNet\_enh-Core  
=> Change category to F  
=> The CR is agreed in principle
- [R2-162505](#) Correction on DCH enhancements Huawei, HiSilicon draftCR 25.300 12.5.0- - F  
Rel-12 UTRA\_DCHenh-Core  
*moved from 12.11*  
- Nokia Net thinks we should be more positive in the wording  
=> Change the wording to “may be configured only in the following case”  
- Nokia Net wonders if this terminology “PS 0kbps” is used. Ericsson thinks we can check the terminology used  
=> check offline for the correct terminology  
=> The CR is revised in [R2-162983](#)
- [R2-162983](#) Correction on DCH enhancements Huawei, HiSilicon draftCR 25.300 12.5.0- - F  
Rel-12 UTRA\_DCHenh-Core  
=> The CR is agreed in principle
- [R2-162377](#) Correction on DCH enhancements Huawei, HiSilicon draftCR 25.300 13.1.0- - A  
Rel-13 UTRA\_DCHenh-Core  
=> Not treated
- 

## 12 UTRA Release 13

### 12.1 WI: L2/L3 Downlink enhancements for UMTS

(UTRA\_EDL\_L23-Core, leading WG: RAN2, started: June 15, closed: Dec. 15, WID: [RP-152184](#))

- [R2-162341](#) Retrievable configurations in RRC signaling Ericsson discussion  
- Huawei doesn't think that the proposal 1 is not a simple solution  
=> No support for the proposals  
=> Noted
- [R2-162342](#) Storing of the SRB configuration at RRC Connection Setup Ericsson draftCR 25.331  
13.2.0- - F Rel-13 UTRA\_EDL\_L23-Core  
=> revised in [R2-162343](#)
- [R2-162343](#) Storing of the SRB configuration as a retrievable configuration Ericsson draftCR 25.331  
13.2.0- - F Rel-13 UTRA\_EDL\_L23-Core  
=> Not treated
- [R2-162344](#) Correction of retrievable configurations Ericsson draftCR 25.331 13.2.0- - F Rel-13  
UTRA\_EDL\_L23-Core  
=> revised in [R2-162347](#)
- [R2-162347](#) Correction of retrievable configurations Ericsson draftCR 25.331 13.2.0- - F Rel-13  
UTRA\_EDL\_L23-Core  
=> Not treated
- [R2-162345](#) Physical channel parameters in retrievable configurations Ericsson discussion  
- Huawei thinks that there is an alternative to this. The network can choose to not provide those physical channels if it thinks that they are highly dynamic.  
=> Noted
- [R2-162346](#) Corrected handling of physical channel parameters in retrievable configurations Ericsson  
draftCR 25.331 13.2.0- - F Rel-13 UTRA\_EDL\_L23-Core  
=> Not treated
- [R2-162512](#) Corrections and clarifications to URA\_PCH with seamless transition to CELL\_FACH state  
functionality Ericsson draftCR 25.331 13.2.0- - F Rel-13 UTRA\_EDL\_L23-Core  
- Huawei doesn't think the first changes are needed. The UE should have the same behaviour in both CELL\_PCH and URA\_PCH. Ericsson thinks that it should be explicit

that the UE performs actions related to 8.5.56. Qualcomm thinks that the UE eventually goes there. Qualcomm checked and they think that the changes are needed

- Ericsson notes that there seems to be a problem with legacy text in 8.5.41 “in CELL\_PCH with variable H\_RNTI not set”. Shouldn't this be “set”?

=> Ericsson to check the legacy text

=> the Rel-13 text in 8.5.41 changed to “UTRAN in CELL\_PCH with variable H\_RNTI not set or in URA\_PCH state”

- Huawei is not sure why the change in 8.4.2.2 as this is legacy text. Ericsson has copied the same behaviour as the other if condition.

=> Change “if not already in CELL\_FACH” in 8.5.40 and 8.5.47 are not needed

=> the CR is revised in [R2-162984](#)

[R2-162984](#) Corrections and clarifications to URA\_PCH with seamless transition to CELL\_FACH state functionality Ericsson draft CR 25.331 13.2.0- - F Rel-13 UTRA\_EDL\_L23-Core

=> changes in 8.5.41 are not there

=> impact analysis has to be added

=> Delete “if not already in CELL\_FACH state” in 8.5.56

=> the CR is postponed

**Withdrawn:**

[R2-162509](#) Corrections and clarifications to URA\_PCH with seamless transition to CELL\_FACH state functionality Ericsson CR 25.331 13.2.05853 - F Rel-13 UTRA\_EDL\_L23-Core

## 12.2 WI: Power saving enhancements for UMTS

(UTRA\_SDATA\_POWSAV-Core, leading WG: RAN2, started: June 15, closed: Dec 15, WID: [RP-151998](#))

No contribution received.

## 12.3 WI: Support of EVS over UTRAN CS

(EVSoCS\_UTRAN-Core; leading WG: RAN2, started: Dec. 14, closed: Dec 15, WID: [RP-142282](#))

No contribution received.

## 12.4 WI: Network-Assisted Interference Cancellation and Suppression for UMTS

(UTRA\_NAICS-Core, Leading WG: RAN1, started: Sep. 15, closed: Dec. 2015, WID: [RP-151879](#))

No contribution received.

## 12.5 WI: Multiflow Enhancements for UTRA

(HSDPA\_MFTX\_enh-Core, leading WG: RAN2, started March 15, closed: Sep. 15, WID: [RP-150288](#))

No contribution received.

## 12.6 WI: HSPA Dual-Band UL carrier aggregation

(HSUPA\_DB\_MC-Core; leading WG: RAN4; REL-13; started: Dec. 14; closed: Dec. 15; WID: [RP-151852](#))

No contribution received.

## 12.7 WI: Application specific Congestion control

(ACDC-RAN-Core; leading WG: RAN2; REL-13; started: Mar. 15; closed: Dec. 15; WID: [RP-150512](#))

UMTS specific aspects of ACDC

No contribution received.

## 12.8 WI: Indoor Positioning enhancements for UTRA and LTE

(UTRA\_LTE\_iPos\_enh-Core; leading WG: RAN2; REL-13; started: Sept. 15; closed: Dec. 15; WID: [RP-152251](#))

*UMTS specific aspects of indoor positioning*

No contribution received.

## 12.9 WI: Downlink TPC enhancements for UMTS

(UTRA\_EDL\_TPC-Core; leading WG: RAN1; REL-13; started: Sept. 15; closed: Dec. 15; WID: [RP-151880](#))

No contribution received.

## 12.10 WI: Dual Carrier HSUPA Enhancements for UTRAN CS

(DC\_HSUPA\_CS-Core; leading WG: RAN2; REL-13; started: Sept. 15; closed: Dec. 15; WID: [RP-151780](#))

No contribution received.

## 12.11 UTRA TEI13 enhancements

Small Technical Enhancements affecting UMTS Rel-13 that do not belong to any Rel-13 WI.

Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

[R2-162372](#) Correction on UE behaviours on storing E-RGCH configuration Huawei, HiSilicon draftCR  
25.331 13.2.0- - F Rel-13 RANimp-DC\_HSUPA, TEI13

Not treated

[R2-162211](#) Clarifications on the E-HICH and E-RGCH configuration combinations Nokia, Alcatel-Lucent  
Shanghai Bell other  
*moved from 13.6*

- Huawei agrees but thinks that we should align the secondary frequency with this logic.  
Nokia Net thinks that the network would mimic a similar configuration as the primary frequency and doesn't think the change is needed. Ericsson thinks that it could be good to align.
- => Need to check with RAN1 colleagues whether this is really a problem or if there is something broken
- => Noted

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## 13 UTRA Rel-14

### 13.1 WI: RRC optimization for UMTS

(UTRA\_RRCopt-Core; leading WG: RAN2; REL-14; started: Dec. 15; target: Sept. 16; WID: [RP-160287](#))

Time budget 2 TUs

#### 13.1.1 Filtered UPH measurements;

[R2-162351](#) Generic UPH measurement Ericsson discussion

- NN: we see different proposals in other contributions, we should treat together.
- NN: for proposal 7, in case of other solution options, there might impact stage 2.
- Chair: any analysis on the overlap?
- E///: will be discussed in next meeting.
- => Noted.

[R2-162352](#) Introduction of UPH measurements Ericsson draftCR 25.331 13.2.0- - B Rel-14  
UTRA\_RRCopt-Core  
=> Postponed.

- [R2-162389](#) Discussion on UPH measurement Huawei, HiSilicon discussion
- E///: if we go for MAC level UPH report, we need updates to MAC spec, e.g. ID, so we think it should be cleaner to go for a RRC level approach.
  - NN: with your proposal, does the UE still need a new MAC measurement?
  - E///: you need to configure since there are new values for those parameters, so it should be a new one.
- ⇒ Noted.
- [R2-162575](#) Further discussion on Filtered UPH measurements Nokia, Alcatel-Lucent Shanghai Bell discussion
- E///: anyway there will be RRC impacts, since you will have to configure new events.
  - NN: no, there is no impact to RRC, since there is already UPH report in SI.
  - E///: but you require this kind of UPH report very often.
  - Huawei: there are some difference between E/// and NN proposal, in NN proposal, NodeB has to periodically report the filtering UPH report for RNC's decision.
  - NN: from NodeB to RNC, you could also define event based which is current way.
  - Chair: now we have three proposals on table:
    1. new RRC event for UPH reporting
    2. to reuse UPH report for TTI switching, and then NodeB reports the UPH report to RNC.
    3. to reuse R11 MDT NBAP UPH report.
  - E///: if we go for a solution other than new RRC event, it is out of the WI scope. NN confirms.
- ⇒ After offline discussion: most companies are OK with RRC level approach; for MAC level approach, will be discussed in next meeting.
- Huawei: if RRC level approach is accepted, we don't think there is a need to discuss MAC level approach.
  - NN: we are neutral with RRC level approach because of the objective of the WI is RRC optimization.
- ⇒ Noted.

### 13.1.2 Simultaneous RAB setup and release

- [R2-162349](#) Simultaneous RAB Setup and Release Ericsson discussion
- NN: we support.
  - Chair: RB setup/release also included? What about signalling RB, part of the WI scope?
  - E///: when simultaneous RAB setup/release is allowed, simultaneous RB setup/release is automatically allowed. For SRB, not necessary to update the WID, but it is not explicitly written in the WI.
  - Huawei: could you please give more use case for SRB?
  - E///: if there were SRB 1/2/3/4 established, and a new SRB is to be established.
  - NN: we need to check the use case of simultaneous SRB setup/release.
- ⇒ Noted.
- [R2-162350](#) Introduction of the possibility to setup and release radio access bearers, radio bearers and signalling radio bearers in the Radio Bearer Reconfiguration message Ericsson draftCR 25.331 13.2.0- - B Rel-14 UTRA\_RRCopt-Core
- E///: in general, RAB/RB setup/release info were included, also for signalling RB, but SCRI is not included.
  - Huawei: the title is too long. Do we need a short stage 2 description to 25.300?
  - E///: we will check for next meeting.
- ⇒ Postponed.
- [R2-162387](#) Discussion on RAB handling Huawei, HiSilicon discussion
- E///: for the 50ms saving time, where does it come from?
  - Huawei: just rough estimation, since one RRC message takes about 100ms, a combined one may take a little bit longer than 100ms, so it is approximately 50ms.
  - E///: but you didn't take the response message into account, at least one response/complete message also saved.
  - E///: we also agree with the proposal that we should focus on one message to update.
- ⇒ Noted.
- [R2-162577](#) Further discussion on RRC level optimization Nokia, Alcatel-Lucent Shanghai Bell discussion
- E///: for proposal 1, we agree. We also agree with the analysis on which IEs to be included.

- NN: for the moment we don't have SRB setup/release in the RBR message, but RB related IEs were there.
  - E///: "Signalling Connection release indication" is for release a connection to PS or CS domain, not for signalling RB.
  - Huawei: we are fine with the intention of proposal 2, why just restrict to physical channel layer?
  - NN: we are fine to remove this restriction.
  - E///: for proposal 2, now we are little bit concerned, since current implementation will be impacted if this approach is followed.
  - Chair: we need to analyze case by case for proposal 2, when new features are introduced.
- ⇒ Noted.

⇒ **Agreements:**

1. We agree simultaneous RAB setup/release and simultaneous RB setup/release to be combined in one RRC message, which is Radio Bearer Reconfiguration message (RBR). FFS for simultaneous SRB setup/release.
2. The following IEs will be included in RBR message: RAB information to setup list, Signalling Connection release indication, RB information to release list

### 13.1.3 Others

- [R2-162348](#) Work Plan for the WI RRC optimization for UMTS Ericsson discussion
- Chair: meeting number should be updated.
- ⇒ In 2.2.2, RAN2#93bis -> RAN2#94; in 2.2.3, RAN2#93bis -> RAN#95, RAN3#92 -> RAN3#93.
- ⇒ With these changes above, the work plan is endorsed.
- ⇒ Noted

## 13.2 WI: DTX/DRX enhancements in CELL\_FACH

(FACH\_DTXDRX-Core, leading WG: RAN2; REL-14; started: Dec. 15; target: Sept. 16; WID: [RP-160185](#))

*Time budget 2 TUs*

**Incoming LS:**

- [R2-162130](#) LS on RAN1 Cell FACH DTx/DRx Enhancements ([R1-161187](#); contact: Qualcomm) RAN1 LS in  
to: RAN2 Rel-14 FACH\_DTXDRX-Core  
*moved from 3.3*  
=> Noted.

- [R2-162576](#) Discussion on DRX configuration enhancement in CELL\_FACH Huawei, HiSilicon discussion

**Proposal 1: It is proposed RAN2 to inform RAN1 current RAN2 spec status, and suggest RAN1 to consider the performance gain of 2ms compared with 4ms Rx burst size.**

Ericsson: We agree with the proposal from Huawei.

Nokia: Would the specification impact in RAN2 be large?.

Huawei: We think it is marginal change.

Nokia: It seems RAN2 already discussed this as part of REL-11 and thought to be not necessary. Do we need to discuss it again?

- ⇒ We will send a reply LS to RAN1 outlining that today the current RAN2 spec allows configuring the UE to listen two HS-SCCH sub-frames every FACH DRX cycle in the 2-level FACH DRX mechanism

- [R2-162985](#) Reply LS to RAN1 Cell FACH DTx/DRx Enhancements ([R2-162985](#)contact: Qualcomm) RAN2 LS out to: RAN1 Rel-14 FACH\_DTXDRX-Core

- => Delete “ With the existing FACH DRX mechanism, the UE has to be configured to listen to both HS-SCCH and HS-PDSCH”
- => the LS is agreed in R2-162986 with the changes above

[R2-162580](#) Discussion on enhancement to CELL\_FACH DTX Huawei, HiSilicon discussion  
=> Noted.

[R2-162673](#) Resource blocking and the introduction of DTX for common E-DCH Ericsson discussion late  
Huawei: Is this also submitted to RAN1?  
Ericsson: Yes, this is a summary of RAN1 paper.  
Huawei: Lengthening the timer will impact capacity, but our proposal in [R2-162580](#) may help capacity.  
=> Noted.

### 13.3 SI: Study on Multi-Carrier Enhancements for UMTS

(FS\_UTRA\_MCe, leading WG: RAN1; REL-14; started: Dec. 15; target: June 16; SID: [RP-152290](#))

*Time budget 2 TUs*

#### Incoming LS:

[R2-162129](#) LS on RAN1 multi-carrier enhancements for UMTS agreements ([R1-161185](#); contact: Huawei)  
RAN1 LS in to: RAN2 Rel-14 FS\_UTRA\_MCe  
*moved from 3.3*  
=> Noted.

[R2-162378](#) Discussion on enhanced TTI switching in MC enhancements Huawei, HiSilicon discussion  
Ericsson: We see a large RAN2 spec impact for this solution without seeing any gain as yet for the scenarios. We would like to wait for RAN1 to conclude before we discuss solutions which have large impact.  
Nokia: If the gains are found to exist, should we tie any TTI switching to the REL-12 feature. REL-12 TTI switching is only supported in SC case. It may be better to use the legacy reconfiguration procedure.  
Ericsson: If we see the gain with the scenarios, then we are open to re-use of the TTI switching as a solution.  
Huawei: In REL-14 we may have more choices, so it could be an option to have the fast TTI switching on each of the carriers.  
=> Noted.

[R2-162379](#) TP on enhanced TTI switching in MC enhancements Huawei, HiSilicon pCR 25.707 0.1.0 - - - Rel-14 FS\_UTRA\_MCe  
Ericsson: There is a mistake in the spelling of Radio Bearer Reconfiguration in Figure 1.  
Nokia: Do we need to send anything to RAN1 to include in TR now, or better that they conclude.  
Huawei: We think it does not hurt to send TP to RAN1.  
Ericsson: We think we can wait till work has progressed more in RAN1.  
Nokia: Proposed signalling flow also need RAN3 evaluation.  
Huawei: We can wait, but we encourage companies to work on TP's for next meeting.  
=> Postponed

[R2-162380](#) Discussion on TTI configuration in MC enhancements Huawei, HiSilicon discussion  
Ericsson: We again have a general comment on the spec impacts without seeing any gain yet for the scenarios.  
Ericsson: The option to pre-configure per frequency seems to be better.  
Huawei: What about HS-SCCH Order, any preference?  
Ericsson: We need to look more into it.  
=> Noted.

[R2-162381](#) TP on TTI configuration in MC enhancements Huawei, HiSilicon pCR 25.707 0.1.0 - - - Rel-14 FS\_UTRA\_MCe  
Not treated.

[R2-162382](#) Discussion on CFN handling in MC enhancements Huawei, HiSilicon discussion  
=> Noted.

- [R2-162383](#) TP on CFN handling in MC enhancements Huawei, HiSilicon pCR 25.707 0.1.0 - - -  
Rel-14 FS\_UTRA\_MCe  
=> Not treated.
- [R2-162384](#) Discussion on E-TFC selection in MC enhancements Huawei, HiSilicon discussion  
Ericsson: For Issue 2 maybe there is nothing to do, we do it already today for 10ms SC.  
Huawei: We were thinking about possible performance enhancements.  
Ericsson: We think it will have large impact and also impact the SRB.  
=> Noted.
- [R2-162385](#) TP on E-TFC selection in MC enhancements Huawei, HiSilicon pCR 25.707 0.1.0 - - -  
- Rel-14 FS\_UTRA\_MCe  
=> Not treated
- [R2-162386](#) Discussion on general impact in RAN2 Huawei, HiSilicon discussion  
=> Noted.
- [R2-162655](#) Considerations on Multicarrier Enhancements for UMTS Ericsson discussion  
Huawei: In the observation, does this mean that the NW has to reconfigure the UE to 10ms with RRC Reconfiguration procedure.  
Ericsson: Yes  
Huawei: How does NW know UE is power limited  
Ericsson: Use Event 6x in Measurement Report.  
=> Noted.

## 13.4 WI: Further Indoor Positioning Enhancements for UTRA and LTE

(UTRA\_LTE\_iPos\_enh2-Core, leading WG: RAN2; REL-14; started: Mar. 16; target: Dec. 16; WID: [RP-160538](#))

*Time budget 0.25 TUs*

- [R2-162791](#) Assistance Data for Indoor positioning enhancements NextNav, AT&T, Broadcom draftCR 25.305 13.0.0- - B Rel-14 UTRA\_LTE\_iPos\_enh2-Core
- Intel: in 4.3.5, for barometric, to be precise, should be “height or vertical component”; in 14.1, for UE standalone, “without assistance data” is not needed; 14.3, updates needed in step 5; in 17.2.x, description should be generic;
  - Chair: why WLAN/BT not included?
  - NextNav: will be addressed in another CR.
  - E///: in 6.6.4.1.3, “a subset of or all” is not precise? NextNav: the intention is to have reference pressure info and other possible data.
  - Intel: what's your plan for next meeting? NextNav: to get stage 2 completed by May; and stage 3 afterwards.
  - Chair: after some initial agreements are reached in main session, we will come back on this and update as a base line CR for next meeting.
- => revised in [R2-162977](#)
- [R2-162977](#) Assistance Data for Indoor positioning enhancements NextNav, AT&T, Broadcom draftCR 25.305 13.0.0- - B Rel-14 UTRA\_LTE\_iPos\_enh2-Core
- => More agreements in the main session are need
- => the CR is postponed

## 13.5 SI: Study on HSPA and LTE Joint Operation

(FS\_UTRA\_LTE\_JOP, leading WG: RAN3; REL-14; started: Mar. 16; target: Sept. 16; SID: [RP-160571](#))

*Time budget 0.5TUs*

- [R2-162733](#) Motivation of HSPA and LTE joint operation China Unicom discussion
- NN: what's the target for this RAN2 meeting?
  - CUC: since it is RAN3 leading, RAN3 has not discussed yet, so our intention is to try to get some comments and consensus.
  - E///: we are not sure about the motivation of CS and PS parallel transmission?
  - CUC: this is our operator's request.
  - QC: we believe the requirement is real since it has been clarified several times by CUC.
  - E///: do we need to make some general assumptions, like UE capability?

- QC: it is not challenging from UE perspective.
  - NN: from network point of view, we should not have solution based on one type of UE;
- ⇒ Noted.

[R2-162726](#)

Consideration on the UMTS and LTE joint operation China Unicom discussion

- NN: we support proposal 3, have concerns on principle 7, i.e. dual stand-by, we think dual stand-by should also be considered.
  - CUC: considering the limited time space, we would like to focus on use case of camping LTE;
  - NN: we agree that UE should camp on LTE, but UE could also camp on UMTS at the same time.
  - QC: proposal 1, we should not discuss dual Rx/Tx, we are OK with that; also fine with proposal 2;
  - E///: the assumption is: UE camping on LTE only? This is the intention.
  - CUC: the strategy is to camp on LTE only for a dual mode terminal;
  - NN: in case of a UE with two receivers, why dual camp not allowed?
  - QC: single or dual camp is not related with the number of receivers; I think CUC's intention is for power saving;
  - NN: we would like to keep the possibility, especially for a UE with two receivers; and this will not impact core network;
  - QC: we are not against the dual camp case, but we need to prioritize, we need to respect operator's requirements; from UE point of view, RF handling is different;
  - Huawei: shall we inform RAN3 our RAN2 discussion? QC: RAN3 is also discussing this, and RAN3 is the leading group.
  - Huawei: for proposal 3, it seems it is mainly RAN2's scope.
- ⇒ The common understanding in RAN2 is: dual RRC approach is preferred.
- ⇒ Noted.

[R2-162907](#)

On concurrent UMTS CS and LTE PS operation Qualcomm Incorporated discussion

- E///: what is enhanced CSFB?
  - QC: just a name now, possibly we may reuse the whole legacy procedure or, we may have enhancements on top of it, just as in Huawei's paper. It might be impossible to keep MME fully blinded.
- ⇒ Noted.

[R2-162579](#)

Initial consideration in U&L joint operation SI Nokia, Alcatel-Lucent Shanghai Bell discussion

- Huawei: is proposal for dual standby? NN: no, we just focus on scenario description: CS over UMTS and PS over LTE.
- ⇒ Noted.

[R2-162581](#)

Working assumption on UMTS & LTE joint operation Huawei, HiSilicon discussion

- NN: is this paper linked to single standby case?
  - Huawei: our assumption is to be based on single standby, this paper is not linked to.
- ⇒ Noted.

[R2-162582](#)

Analysis on procedures of initiating PS service in LTE with CS service ongoing in UMTS Huawei, HiSilicon discussion

- QC: what is the exact meaning of observation? Because you need timing alignment between RATs, there might be RAN2 impacts.
  - Huawei: trying to say that the impacts are on NAS level, but we need further study.
- ⇒ Noted.

[R2-162583](#)

Analysis on procedures of initiating MT&MO voice call in LTE Huawei, HiSilicon discussion

- QC: what's difference between 1a and 1b?
  - Huawei: the difference is whether MME is aware of UE's operating mode or not.
  - E///: so we will see RAN3's conclusion? Yes.
- ⇒ Noted.

[R2-162961](#)

Initial considerations on HSPA and LTE Joint Operation Ericsson Discussion late

- CUC: it seems that your observations 3&4 don't fall into the SI scope which we want to concurrent CS & PS. We are also interested in observation 1.
- NN: in your observations 1, when CS is established, if this UE is still camped on LTE side?
- E///: it depends, could be. When the paper was written, it mainly focused on non-concurrent case.

- QC: a general comment is, the paper is not for the CUC's SI scope, it is mainly for CSFB enhancements.
  - E///: yes, this is mainly not for con-current, but the enhancements could still be used for the proposals by Huawei & QC.
  - QC: but this needs more LTE work, complexities are introduced in LTE; could be discussed separately, since it is not in the scope of this SI.
  - E///: in the SI phase, we would like to see this listed as part of the possible solutions in the TR, and then we could see if we could do it in the WI phase if companies are interested.
  - Huawei: for observation 1&2, to QC, the main work is in LTE?
  - QC: in general, the proposal from E/// tries to modify CSFB procedure, which will involve more LTE.
- => Noted.

## 13.6 TEI14

Small Technical Enhancements affecting UMTS Rel-14 that do not belong to any Rel-14 WI.

Note: A TEI enhancement proposal should be treated for only one meeting cycle and involve only one WG. Otherwise, a WI should be proposed at RAN plenary!

[R2-162212](#) Latency reduction for uplink signalling traffic    Nokia, Alcatel-Lucent Shanghai Bell  
discussion  
late  
⇒ Withdrawn.

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## 14 Outgoing LSs and email discussions from UTRA session

### 14.1 Agreed outgoing LSs from UTRA session

R2-162986 Reply LS to RAN1 Cell FACH DTx/DRx Enhancements    RAN2 LS out    to: RAN1 from: RAN2  
(re: to R2-162130/R1-161187) Rel-14    FACH\_DTXDRX-Core

### 14.2 Email discussions from UTRA

No email discussions planned

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## 15 Comebacks

This agenda item will be used during the meeting. No documents are supposed to be submitted by delegates.

### 15.1 LTE breakout sessions

#### 15.1.1 Report from LTE Break-Out session

[R2-163056](#) Report from LTE Break-Out Session, Vice-Chair (InterDigital)  
CBF: Report from LTE Break-Out Session, Vice-Chair (InterDigital)  
=> Approved

#### Comebacks from session

[R2-163002](#) Miscellaneous correction for sidelink Huawei, HiSilicon, ITRI    draftCR    36.331    13.1.0-    -  
F    Rel-13    LTE\_eD2D\_Prox-Core  
[CB]  
=> Agreed in principle

- [R2-162157](#) Corrections for sidelink communication transmission Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
- Qualcomm thinks that this is just re-writing the existing agreement.  
=> Come Back  
=> Postponed
- [R2-162217](#) Corrections on description of commTxAllowRelayCommon CATT draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core  
- Nokia Net thinks that commTxAllowRelayCommon is only for the relay UE. CATT thinks that the intention is that the remote UE can only use the common pool, not the relay. Ericsson thinks that the IE is for both.  
=> The intention is that the commonTxRelaypool is used for the remote UE only.  
=> Come Back on how this should be capture if it at all  
=> The CR is postponed
- [R2-163003](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core  
=> Agreed in principle
- [R2-163009](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.304 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core  
=> Agreed in principle
- [R2-163004](#) Corrections on sidelink related description in TS36.302 CATT draftCR 36.302 13.1.0- -  
F Rel-13 LTE\_eD2D\_Prox-Core  
=> Agreed in principle
- [R2-163007](#) Draft LS to SA2 on QoS requirements for V2X (Huawei)  
- MediaTek don't think the LS needs to be sent.  
=> Approved in R2-163134

## 15.1.2 Report from LTE Break-Out session

- [R2-163057](#) Report from LTE Break-Out Session, Vice-Chair (CMCC)  
CBF: Report from LTE Break-Out Session, Vice-Chair (CMCC)  
=> Approved

### Comebacks from session

- [R2-163022](#) Draft LS on the feasibility of mobility enhancement solutions Draft LS out ZTE  
Revised to R2-163026
- [R2-163026](#) Draft LS on the feasibility of mobility enhancement solutions Draft LS out ZTE  
- Nokia explain that the attachment in R2-163023 summarises the solution presented in this meeting.  
=> change "to evaluate" to "to help RAN2 evaluate"  
✓ => Approved in R2-163135

## 15.1.3 Report from NB-IOT session

- [R2-163058](#) Report from NB-IOT Break-Out Session, Session Chair (MediaTek)  
=> Reword agreement on [R2-162550](#) is agreed "88bits is the only TB size that is assumed, when specifying support for UL CCCH"  
=> Report revised in R2-163133
- [R2-163133](#) Report from NB-IOT Break-Out Session, Session Chair (MediaTek)  
- Report was revised to include the status of incoming LS and include one email discussion that was accidentally deleted.  
=> Approved

### Comebacks from NB-IOT

- [R2-163041](#) Draft LS on Security aspects of CIOT to SA3 ZTE LSout

(ask on short MAC-I, Inform on Resume Procedure)

=> Will be discussed by email

☒ **[93#03][LTE/NB-IOT] LS to SA3 (ZTE)**

Intended outcome: Approved LS

Deadline: Thursday 21/04/2016

[R2-163126](#) Draft LS on Bearer id list in Resume message 3 Intel LSout to: SA2  
=> Approved in R2-163149

[R2-163127](#) LS to CT1 and RAN3 on DRX agreements Ericsson Lout  
- Nokia think the PTW values are being discussed for MTC. Ericsson explain that this is why they are working assumptions.  
=> Approved

## 15.2 UMTS breakout session

## 15.3 Main session

This section contains a temporary list of comebacks (press F9 to update while the cursor is inside the list).

☒ => Revision in R2-163062

☒ => Revised to R2-163140

☒ - Comeback to treat is time available

## 15.4 Email Discussions from main session

This section contains a **preliminary list** of email discussions (press F9 to update while the cursor is inside the list). A complete list will be provided on the RAN2 email reflector after the meeting. Please see Annex F for complete email discussion list.

- ☒ [93#xx][LTE/HPUE] (Sprint) Discuss whether the proposed signalling is beneficial and if so decide on the impact to RAN2 specs and potential release of any change. Information to be provided to RAN4 by LS from next meeting. Could draft LS depending on progress of email. Intended outcome: Report and potential LS to next meeting. Deadline: Thursday 05/05/2016
- ☒ [93#xx][LTE/Latred Study] Update TR (Ericsson) Intended outcome: Updated TR with RAN1 agreements. Deadline: Thursday 21/04/2016
- ☒ [93#xx][LTE/TDD/FDD capabilities] (Huawei) Discuss the need for different FDD/TDD capabilities for those added in R13 Intended outcome: Email discussion report and draft CR to next meeting Deadline: Thursday 05/05/2016
- ☒ [93#xx][LTE/MTC/NB-IOT] NAS timer extension (Ericsson) Discuss the proposal in R2-162996. Discuss in the scope of MTC and NB-IOT Intended outcome: Email discussion report to NB-IOT ad-hoc Deadline: Thursday 28/04/2016
- ☒ [93#xx][LTE/LWI] State transitions (Samsung) Intended outcome: Email discussion report and potentially draft CR to the next meeting Deadline: Thursday 05/05/2016
- ☒ [93#xx][LTE/eDRX] eDRX paging solution (Ericsson) To find solution to the problem identified in R2-162806 and potentially discuss other issues identified Intended outcome: Email discussion report and draft CR Deadline: Thursday 05/05/2016
- ☒ [93#xx][LTE/CIOT opt] Progress stage 3 CR (Ericsson) Intended outcome: Draft CR to next meeting and identification of any remaining issues for discussion. Details of the CR should be based on the NB-IOT CRs. Deadline: Thursday 12/05/2016

- ☒ [93#xx][LTE/Unattended data] (Verizon) Intended outcome: Agreeable CR to the next meeting Deadline: Thursday 05/05/2016
- ☒ [93#xx][LTE/eLAA] Capture agreements in running stage 2 CR (Huawei) Intended outcome: Endorsed running CR Deadline: Thursday 21/04/2016
- ☒ [93#xx][NR/TR skeleton structure] (DOCOMO) Discuss skeleton structure for RAN2 NR TR Intended outcome: Draft skeleton to next meeting Deadline: Thursday 05/05/2016
- ☒ [93#xx][NR/Deployment scenarios] (DOCOMO) Aim to identify deployment scenarios that can be captured in the TR. Intended outcome: Email discussion report to next meeting Deadline: Thursday 05/05/2016
- ☒ [93#xx][LTE/NB-IOT] LS to SA3 (ZTE) Intended outcome: Approved LS Deadline: Thursday 21/04/2016
- ☒ [LTE/V2V] Tx PC5 and Uu path switch for V2V – Huawei
- ☒ [LTE/V2V] Mobility for V2V – Intel
- ☒ [LTE/V2V] Running 36.300 – LG
- ☒ [LTE/V2X] – TP capturing RAN2 agreements
- ☒ [LTE/V2V] Tx PC5 and Uu path switch for V2V – Huawei
- ☒ [LTE/V2V] Mobility for V2V – Intel
- ☒ [LTE/V2V] Running 36.300 – LG
- ☒ [LTE/V2X] – TP capturing RAN2 agreements
- ☒ [LTE/eVoLTE] TR skeleton and capturing agreements (CMCC)
- ☒ [LTE/eVoLTE] Identify the potential problems from signalling aspect (Huawei)
- ☒ [LTE/Mobility enhancement] Discussion on solution 2 family (ZTE)
- ☒ [LTE/eVoLTE] TR skeleton and capturing agreements (CMCC)
- ☒ [LTE/eVoLTE] Identify the potential problems from signalling aspect (Huawei)
- ☒ [LTE/Mobility enhancement] Discussion on solution 2 family (ZTE)
- ☒ Email discussion on timers, and potential impact to NAS timers (Huawei)
- ☒ RACH, Open issues from R2-162331 and R2-162360 on a) PRACH configuration including PDCCH Period b) Necessary Updates to RA-RNTI formula and RAR contents, c) BI value definition/mapping (ZTE).
- ☒ t-reordering (docomo)
- ☒ RACH, Open issues from R2-162331 and R2-162360 on a) PRACH configuration including PDCCH Period b) Necessary Updates to RA-RNTI formula and RAR contents, c) BI value definition/mapping (ZTE).
- ☒ Email discussion on t-reordering, on how to achieve the desired RLC behaviour (docomo)

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## 16 Outgoing LS from LTE and Joint

Draft LSs should be submitted to their corresponding agenda item if there is one. If there is no appropriate agenda item, draft LSs may be submitted to this agenda item. Please see Annex D.

### **Draft outgoing LSs (not related to any Agenda Item above)**

None

## Approved LSs

This section contains a list of approved outgoing LSs (press F9 to update while the cursor is inside the list).

- ✓ => Approved in R2-163142
- ✓ => LS in R2-163064 is approved
- ✓ => Approved in R2-163146
- ✓ => Approved in R2-163135

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## 17 Any other business

### Future meeting dates

Click [here](#) for the overview of all RAN2 and RAN meeting dates.

| MEETING     | DATES                   | LOCATION           | HOST | CO-LOCATION  |
|-------------|-------------------------|--------------------|------|--------------|
| RAN2 #93    | 15 Feb. - 19 Feb. 2016  | Malta              | EF3  | RAN1/2/3/4/5 |
| RAN #71     | 07 Mar. - 10. Mar. 2016 | Gotebory, Sweden   | EF3  |              |
| RAN2 #93bis | 11 Apr. - 15. Apr. 2016 | Dubrovnik, Croatia | EF3  |              |
| RAN2 #94    | 23 May - 27 May. 2016   | Nanjing, China     | CMCC | RAN1/2/3/4/5 |
| RAN #72     | 13 Jun. -16 Jun. 2016.  | Busan, South Korea | TTA  |              |
| RAN2 #95    | 22 Aug. - 26 Aug. 2016  | Gotebory, Sweden   | EF3  |              |
| RAN #73     | 19 Sep. - 22 Sep. 2016  | tbd, USA           | NAF3 |              |

EF3: European Friends of 3GPP  
 NAF3: North American Friends of 3GPP  
 JF3: Japanese Friends of 3GPP

### Other

[R2-162847](#) Work plan for eMBMS enhancements for LTE Ericsson discussion  
 Not treated

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## 18 Closing of the meeting (17:00)

The TSG RAN WG2 chairman Richard Burbidge (Intel Corporation) thanked the delegates for participating and session chairs for contributing to RAN WG2 meeting #93bis. He also thanked the European Friends of 3GPP (EF3) for hosting this meeting.

TSG RAN WG2 chairman Richard Burbidge (Intel Corporation) closed the meeting on Friday 15.04.2016 around 17:15.

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## Annex A: List of participants

The list of participants of this RAN WG2 meeting #93bis is will be attached to this report.

Total number of participants: 188 (registered before the meeting: 215)

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## Annex B: List of Tdocs

The list of Tdocs of this RAN WG2 meeting #93bis is attached to this report.

Total number of Tdocs: 1050 of which 48 Tdocs are not available, i.e. 1002 Tdocs are available.

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## Annex C: Incoming liaison statements for TSG RAN WG2 #93bis

| RAN2 Tdoc | title<br>(original Tdoc; contact)                                                                         | source | original Tdoc | status | final LS<br>answer | additional comments |
|-----------|-----------------------------------------------------------------------------------------------------------|--------|---------------|--------|--------------------|---------------------|
| R2-162103 | Reply LS to R2-160405 on per-UE configuration to allow exception reporting (C1-161430; contact: Qualcomm) | CT1    | C1-161430     | noted  | R2-163048          |                     |
| R2-162104 | Existence of CIoT support and NAS protocol details for CIoT (C1-161544; contact: Huawei)                  | CT1    | C1-161544     | noted  | R2-163044          |                     |
| R2-162105 | LS on Geo Information Resource Mapping (R1-161312; coontact: Qualcomm)                                    | RAN1   | R1-161312     | noted  |                    |                     |
| R2-162106 | LS on EB/FD-MIMO Terminologies (R1-161336; contact: Samsung)                                              | RAN1   | R1-161336     | noted  |                    |                     |
| R2-162107 | LS on EBF/FD-MIMO related RAN1 agreements (R1-161512; contact: CATT)                                      | RAN1   | R1-161512     | noted  |                    |                     |
| R2-162108 | LS on ECID positioning for TDD (R1-161518; contact: Intel)                                                | RAN1   | R1-161518     | noted  |                    |                     |

| <b>RAN2 Tdoc</b> | <b>title<br/>(original Tdoc; contact)</b>                                                                         | <b>source</b> | <b>original Tdoc</b>  | <b>status</b> | <b>final LS<br/>answer</b> | <b>additional comments</b> |
|------------------|-------------------------------------------------------------------------------------------------------------------|---------------|-----------------------|---------------|----------------------------|----------------------------|
| R2-162109        | LS on RA-RNTI determination for PRACH in TDD (R1-161524; contact: Qualcomm)                                       | RAN1          | R1-161524             | noted         |                            |                            |
| R2-162110        | LS on Channel Bandwidths for LAA (R1-161540; contact: Ericsson)                                                   | RAN1          | R1-161540             | noted         |                            |                            |
| R2-162111        | LS on physical-layer aspects of NB-SIB1 transmission (R1-161566; contact: Huawei)                                 | RAN1          | R1-161566             | noted         | R2-163125                  |                            |
| R2-162112        | Proposed liaison response to 3GPP on LWA and LWIP (IEEE 802.11-16/0489r2; contact: Broadcom)                      | IEEE 802.11   | IEEE 802.11-16/0489r2 | noted         |                            |                            |
| R2-162113        | Response LS to S3-160274 = R2-161047 on LWIP Solution and DRB distinction (R3-160533; contact: Nokia Networks)    | RAN3          | R3-160533             | noted         |                            |                            |
| R2-162114        | LS on CRS-Assistance signaling for the DL Control Channel IM (R4-161198; contact: Intel)                          | RAN4          | R4-161198             | noted         |                            |                            |
| R2-162115        | Reply LS to R2-154975 on NAICS subset capability (R4-161440; contact: Qualcomm)                                   | RAN4          | R4-161440             | noted         |                            |                            |
| R2-162116        | Reply LS to R1-157821 = R2-161012 on clarification of RSU types (S1-160521; contact: LGE)                         | SA1           | S1-160521             | noted         |                            |                            |
| R2-162117        | Reply LS to S3-160337 = R2-161048 on Clarifications on RRC Resume Request (S2-161260; contact: Qualcomm)          | SA2           | S2-161260             | noted         |                            |                            |
| R2-162118        | Reply LS to C1-161430 = R2-162103 on NB-IoT work progress in RAN2 (S2-161331; contact: Qualcomm)                  | SA2           | S2-161331             | noted         | R2-163047                  |                            |
| R2-162119        | Reply LS to R3-160135 = R2-161014 on questions on NB-IoT (S2-161333; contact: Vodafone)                           | SA2           | S2-161333             | noted         |                            |                            |
| R2-162120        | Reply LS to R3-160147= R2-161017 on CIOT optimization (S2-161344; contact: Samsung)                               | SA2           | S2-161344             | noted         |                            |                            |
| R2-162121        | Reply LS to S3-161544 on Existence of CIoT support and NAS protocol details for CIoT (S2-161345; contact: Huawei) | SA2           | S2-161345             | noted         |                            |                            |

| <b>RAN2 Tdoc</b> | <b>title<br/>(original Tdoc; contact)</b>                                                                                       | <b>source</b> | <b>original Tdoc</b> | <b>status</b> | <b>final LS<br/>answer</b> | <b>additional comments</b> |
|------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------|---------------|----------------------------|----------------------------|
| R2-162122        | Response LS to R2-162018 on CIoT optimization for non-NB-IoT Ues (S2-161352; contact: Nokia Networks)                           | SA2           | S2-161352            | noted         |                            |                            |
| R2-162123        | Reply LS to R2-156977 on extension to field length of PDCP Sequence Number (C4-161500; contact: Nokia Networks)                 | CT4           | C4-161500            | noted         |                            |                            |
| R2-162124        | LS of RRC parameter list for NB-IoT (R1-161446; contact: Huawei)                                                                | RAN1          | R1-161446            | noted         |                            |                            |
| R2-162125        | LS on LTE Rel-13 UE feature list (R1-161547; contact: NTT DOCOMO)                                                               | RAN1          | R1-161547            | noted         |                            |                            |
| R2-162126        | Reply LS to R2-161885 on TS 36.300 section 5 for NB-IoT (R1-161555; contact: Huawei)                                            | RAN1          | R1-161555            | noted         |                            |                            |
| R2-162127        | Response LS to S2-153716 on RAN3 feedback on paging coordination in extended idle mode DRX (R3-160566; contact: Nokia Networks) | RAN3          | R3-160566            | noted         |                            |                            |
| R2-162128        | Reply LS to R2-161948 on paging in NB-IoT (S2-161330; contact: Ericsson)                                                        | SA2           | S2-161330            | noted         |                            |                            |
| R2-162129        | LS on RAN1 multi-carrier enhancements for UMTS agreements (R1-161185; contact: Huawei)                                          | RAN1          | R1-161185            | noted         |                            |                            |
| R2-162130        | LS on RAN1 Cell Fach DTx/DRx Enhancements (R1-161187; contact: Qualcomm)                                                        | RAN1          | R1-161187            | noted         | R2-162986                  |                            |
| R2-162132        | LS on RRC parameters for LTE eMTC (R1-161545; contact: Ericsson)                                                                | RAN1          | R1-161545            | noted         |                            |                            |
| R2-162133        | Reply LS to R2-153973, R2-153966 and R2-161788 on Paging Enhancements (R3-160516; contact: Huawei)                              | RAN3          | R3-160516            | noted         |                            |                            |
| R2-162134        | Reply LS to R2-161943 on available subframes for paging (R1-161985; contact: Huawei)                                            | RAN1          | R1-161985            | noted         |                            |                            |
| R2-162135        | LS on NB-IoT (R1-162065; contact: Huawei)                                                                                       | RAN1          | R1-162065            | noted         |                            |                            |
| R2-162136        | LS on direct SI update indication for NB-IoT (R1-162068; contact: Ericsson)                                                     | RAN1          | R1-162068            | noted         | R2-153049                  |                            |
| R2-162137        | LS on uplink transmission gap in NB-IoT (R1-162069; contact: Sony)                                                              | RAN1          | R1-162069            | noted         |                            |                            |
| R2-162138        | LS on RRC parameter list for NB-IoT (R1-162070; contact: Huawei)                                                                | RAN1          | R1-162070            | noted         |                            |                            |

| <b>RAN2 Tdoc</b> | <b>title<br/>(original Tdoc; contact)</b>                                                                                      | <b>source</b> | <b>original Tdoc</b> | <b>status</b>    | <b>final LS<br/>answer</b> | <b>additional comments</b>             |
|------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------|------------------|----------------------------|----------------------------------------|
| R2-162139        | LS on updated LTE Rel-13 UE feature list (R1-161567; contact: NTT DOCOMO)                                                      | RAN1          | R1-161567            | noted            |                            |                                        |
| R2-162140        | Response LS to C4-161500 = R2-162123 on extension to field length of PDCP Sequence Number (R3-160907; contact: Nokia Networks) | RAN3          | R3-160907            | noted            |                            |                                        |
| R2-162141        | TR for eMBMS enhancements for LTE (R1-163450; contact: Ericsson)                                                               | RAN1          | R1-163450            | noted            |                            |                                        |
| R2-162142        | LS on indication of support of "attach without PDN connectivity" in SIB for NB-IoT and WB-EUTRAN (C1-162103; contact: Intel)   | CT1           |                      | noted            |                            |                                        |
| R2-162143        | Response LS to S2-161352 = R2-162122 on CIoT optimization for non-NB-IoT UEs (C1-162104; contact: Intel)                       | CT1           | C1-162104            | noted            |                            |                                        |
| <b>R2-162144</b> | <b>LS on NB-IoT (R1-163807; contact: Huawei)</b>                                                                               | <b>RAN1</b>   | <b>R1-163807</b>     | <b>available</b> |                            |                                        |
| <b>R2-162145</b> | <b>LS on RRC parameter list for NB-IoT (R1-163809; contact: Huawei)</b>                                                        | <b>RAN1</b>   | <b>R1-163809</b>     | <b>available</b> |                            |                                        |
| R2-162146        | LS on DL broadcast/multicast for V2X (R1-163862; contact: LGE)                                                                 | RAN1          | R1-163862            | noted            |                            |                                        |
| R2-162147        | LS on PRACH preamble power for eMTC (R1-163791; contact: Ericsson)                                                             | RAN1          | R1-163791            | noted            |                            |                                        |
| R2-162148        | LS on signalling of periodic CSI reporting for class A (R1-163668; contact: Samsung)                                           | RAN1          | R1-163668            | noted            |                            |                                        |
| <b>R2-162149</b> | <b>S on carrier frequency and EARFCN for NB-IoT (R4-162854; contact: Huawei)</b>                                               | <b>RAN4</b>   | <b>R4-162854</b>     | <b>available</b> |                            |                                        |
| R2-162991        | LS to RAN2 to Review Handover Optimization for HPUE (R4-161767; contact: Sprint)                                               | RAN4          | R4-161767            | noted            |                            | reply LS postponed to the next meeting |
| R2-162992        | LS on TR update for latency reduction (R1-163922; contact: Ericsson)                                                           | RAN1          | R1-163922            | noted            |                            |                                        |
| <b>R2-162993</b> | <b>LS on UE/band specific support of UL 256QAM (R1-163915; contact: Nokia)</b>                                                 | <b>RAN1</b>   | <b>R1-163915</b>     | <b>available</b> |                            |                                        |
| <b>R2-162994</b> | <b>LS on V2X synchronization procedure (R1-163907; contact: NTT DOCOMO)</b>                                                    | <b>RAN1</b>   | <b>R1-163907</b>     | <b>available</b> |                            |                                        |
| <b>R2-162995</b> | <b>LS on resource allocation for V2V (R1-163906; contact: LGE)</b>                                                             | <b>RAN1</b>   | <b>R1-163906</b>     | <b>available</b> |                            |                                        |

**postponed:** LS answer was postponed to next RAN2 meeting (note: incoming LS will not be presented again at the next meeting and involved parties are requested to submit proposal for draft outgoing LS answer to next meeting).

**Summary:**

- In total: 51 LSs received for RAN2 #93bis (2 on UTRA, 49 on LTE, 0 on joint aspects): all of them were treated.
- 4 resubmissions from RAN2 #93
- All 45 incoming LSs were noted except 6 LS was not treated due to lack of time and will be resubmitted to RAN2 #94.
- 21 of the 51 incoming LSs were received during the RAN2 #93bis meeting:
- For 0 incoming LS an LS answer was **postponed**.

## Annex D: Outgoing liaison statements of TSG RAN WG2 #93bis

Only final outgoing LSs are listed here.

| final LS Tdoc | title                                                                                                             | to        | cc        | contact   | reply to                                        | release | WI               | comments |
|---------------|-------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-------------------------------------------------|---------|------------------|----------|
| R2-162986     | Reply LS to R1-161187 on Cell FACH DTx/DRx Enhancements signalling (to: RAN1; cc: -; contact: Qualcomm)           | RAN1      | -         | Qualcomm  | R1-161187 = R2-162130                           | Rel-14  | FACH_DTXDRX-Core |          |
| R2-163008     | LS to RAN1 on RAN2 agreements related to V2V (to: RAN1; cc: -; contact: Panasonic)                                | RAN1      | -         | Panasonic |                                                 | Rel-14  | LTE_SL_V2V-Core  |          |
| R2-163044     | Reply LS on Existence of CIoT support and NAS protocol details for CIoT (to: CT1, RAN3; cc: SA2; contact: Huawei) | CT1, RAN3 | SA2       | Huawei    | R2-162104 = C1-161544/<br>R2-162142 = C1-162103 | Rel-13  | CIoT-CT          |          |
| R2-163045     | LS on Power Headroom report (to: RAN1; cc: RAN4; contact: Huawei)                                                 | RAN1      | RAN4      | Huawei    |                                                 | Rel-13  | NB_IoT-Core      |          |
| R2-163046     | LS on NB-IoT RRM requirements (to: RAN4; cc: RAN1; contact: Huawei)                                               | RAN4      | RAN1      | Huawei    |                                                 | Rel-13  | NB_IoT-Core      |          |
| R2-163047     | Reply LS on per-UE configuration to allow exception reporting (to: CT1, SA2; cc: RAN3; contact: Qualcomm)         | CT1, SA2  | RAN3      | Qualcomm  | S2-161331 = R2-162118                           | Rel-13  | NB_IoT-Core      |          |
| R2-163048     | Reply LS on per-UE configuration to allow exception reporting (to: CT1, SA2; cc: RAN1, CT4; contact: Qualcomm)    | CT1, SA2  | RAN1, CT4 | Qualcomm  | C1-161430 = R2-162103                           | Rel-13  | NB_IoT-Core      |          |
| R2-163049     | Reply LS on direct SI update indication for NB-IoT (to: RAN1; cc: -; contact: Ericsson)                           | RAN1      | -         | Ericsson  | R1-162068 = R2-162136                           | Rel-13  | NB_IoT-Core      |          |

| final LS Tdoc | title                                                                                                    | to               | cc                   | contact    | reply to                                      | release | WI                    | comments                                                                   |
|---------------|----------------------------------------------------------------------------------------------------------|------------------|----------------------|------------|-----------------------------------------------|---------|-----------------------|----------------------------------------------------------------------------|
| R2-163064     | Response to LS on questions on CIoT (to: SA2, CT1; cc: CT4, RAN1, SA3, RAN3; contact: Vodafone)          | SA2, CT1         | CT4, RAN1, SA3, RAN3 | Vodafone   | C1-160784 = R2-161050, S2-160207              | Rel-13  | CIoT                  |                                                                            |
| R2-163108     | LS on reviewing all LTE features up to Rel-13 for Category M1 UEs (to: RAN1; cc: -; contact: NTT DOCOMO) | RAN1             | -                    | NTT DOCOMO |                                               | Rel-13  | LTE_MTCe2_L1-Core     |                                                                            |
| R2-163122     | LS latest updates about access control for NB-IOT in RAN2 (to: CT1; cc: -; contact: LGE)                 | CT1              | -                    | LGE        |                                               | Rel-13  | NB_IoT-Core           |                                                                            |
| R2-163123     | LS on Maximum upper layer data packet size for NB-IoT (to: CT1, CT4, SA2; cc: -; contact: Qualcomm)      | CT1, CT4, SA2    | -                    | Qualcomm   |                                               | Rel-13  | NB_IOT-Core           |                                                                            |
| R2-163125     | Reply LS on NB-IoT (to: RAN1; cc: -; contact: Huawei)                                                    | RAN1             | -                    | Huawei     | R2-162111 = R1-161566, R2-162135 = R1-162065  | Rel-13  | NB_IoT-Core           |                                                                            |
| R2-163127     | LS on DRX, eDRX and PTW value ranges (to: CT1, RAN3; cc: -; contact: Ericsson)                           | CT1, RAN3        | -                    | Ericsson   |                                               | Rel-13  | NB_IoT-Core           |                                                                            |
| R2-163129     | LS on Security Aspects for NB-IoT (to: SA3; cc: -; contact: ZTE)                                         | SA3              | -                    | ZTE        | result of email discussion [93bis#03][NB-IOT] | Rel-13  | NB_IoT-Core           | LS out will be provided after one week email discussion [93bis#03][NB-IOT] |
| R2-163134     | LS on QoS requirements for V2X (to: SA2; cc: -; contact: Huawei)                                         | SA2              | -                    | Huawei     |                                               | Rel-14  | LTE_SL_V2V-Core       |                                                                            |
| R2-163135     | LS on the feasibility of mobility enhancement solutions (to: RAN1, RAN3, RAN4; cc: -; contact: ZTE)      | RAN1, RAN3, RAN4 | -                    | ZTE        |                                               | Rel-14  | LTE_eMob-Core         | R2-163223 attached                                                         |
| R2-163137     | LS on RLM for PSCell in dual connectivity (to: RAN1, RAN4; cc: -; contact: Intel)                        | RAN1, RAN4       | -                    | Intel      |                                               | Rel-12  | LTE_SC_enh_dualC-Core |                                                                            |

| final LS Tdoc | title                                                                                                                | to             | cc            | contact  | reply to | release | WI                  | comments           |
|---------------|----------------------------------------------------------------------------------------------------------------------|----------------|---------------|----------|----------|---------|---------------------|--------------------|
| R2-163142     | LS on SA3 on LWA stage 2 security related changes (to: SA3; cc: -; contact: Ericsson)                                | SA3            | -             | Ericsson |          | Rel-13  | LTE_WLAN_radio-Core | R2-163090 attached |
| R2-163146     | LS on RAN2 agreements on eLAA (to: RAN1; cc: -; contact: Huawei)                                                     | RAN1           | -             | Huawei   |          | Rel-14  | LTE_eLAA-Core       |                    |
| R2-163147     | LS on key change during HO for eLWA (to: SA3; cc: RAN3; contact: Ericsson)                                           | SA3            | RAN3          | Ericsson |          | Rel-14  | LTE_WLAN_aggr-Core  |                    |
| R2-163148     | LS on enhanced LTE-WLAN Aggregation (eLWA) (to: IEEE802.11; cc: WiFi Alliance; contact: MediaTek)                    | IEEE802.11     | WiFi Alliance | MediaTek |          | Rel-14  | LTE_WLAN_aggr-Core  |                    |
| R2-163149     | LS on CIoT agreements for non-NB-IoT and for the bearer suspended list (to: CT1, SA2, RAN3; cc: CT4; contact: Intel) | CT1, SA2, RAN3 | CT4           | Intel    |          | Rel-13  | TEI13, NB-IoT-Core  |                    |

**Summary:**

In total 23 outgoing LSs of RAN2 #93bis:  
1 on UTRA, 22 on LTE, 0 on joint aspects

## Annex E: List of in principle agreed draftCRs of RAN2 #93bis

In total 100 in principle agreed draftCRs of RAN2 #93bis (including **11** which are implicitly in principle agreed, marked in **yellow**, since their cat.F CRs were in principle agreed) are requested to resubmitted as CRs to RAN2 #94 (incl. cat.A CRs) then these in principle agreed draftCR will be treated as in principle agreed CR in RAN2 #94.

The following table includes all in principle agreed CRs of RAN2 #93bis and CR numbers will be allocated when reserved via 3GU:

| <b>RAN2 #93bis Tdoc</b> | <b>Title</b>                              | <b>Source</b>     | <b>Spec</b> | <b>Spec Version#</b> | <b>CR#</b> | <b>rev</b> | <b>cat</b> | <b>Release</b> | <b>SI/WI</b>         | <b>Comment</b>                                      | <b>Agenda item for RAN2#94</b> |
|-------------------------|-------------------------------------------|-------------------|-------------|----------------------|------------|------------|------------|----------------|----------------------|-----------------------------------------------------|--------------------------------|
| R2-162167               | Correction for sidelink                   | Huawei, HiSilicon | 36.302      | 13.1.0               | -          | -          | F          | Rel-13         | LTE_eD2D_Prox-Core   |                                                     | 7.5.0                          |
| R2-162169               | Correction for sidelink                   | Huawei, HiSilicon | 36.323      | 13.1.0               | -          | -          | F          | Rel-13         | LTE_eD2D_Prox-Core   |                                                     | 7.5.0                          |
| R2-162188               | Correction of RCLWI call flow             | CATT              | 36.300      | 13.3.0               | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core  |                                                     | 7.6.0                          |
| R2-162190               | Variable Handling for RCLWI               | CATT              | 36.331      | 13.1.0               | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core  |                                                     | 7.6.0                          |
| R2-162272               | SC-PTM reception on non-PCell             | Huawei, HiSilicon | 36.302      | 13.1.0               | -          | -          | F          | Rel-13         | LTE_SC_PTM-Core      |                                                     | 7.3.0                          |
| R2-162280               | Corrections on capability report for eCA  | Huawei, HiSilicon | 36.331      | 13.1.0               | -          | -          | F          | Rel-13         | LTE_CA_enh_b5C-Core  |                                                     | 7.2.0                          |
| R2-162373               | Correction on the naming E-DCH decoupling | Huawei, HiSilicon | 25.308      | 13.1.0               | -          | -          | <b>F</b>   | Rel-13         | UTRA_HetNet_enh-Core | Cat.A in CR coversheet should be corrected to cat.F | 11.0                           |
| R2-162375               | Correction on the naming E-DCH decoupling | Huawei, HiSilicon | 25.319      | 13.0.0               | -          | -          | <b>F</b>   | Rel-13         | UTRA_HetNet_enh-Core | Cat.A in CR coversheet should be corrected to cat.F | 11.0                           |
| R2-                     | Correction on the naming E-DCH            | Huawei, HiSilicon | 25.331      | 13.2.0               | -          | -          | <b>F</b>   | Rel-13         | UTRA_HetNet_enh-Core | Cat.A in CR coversheet                              | 11.0                           |

**Draft** Report of 3GPP TSG RAN WG2 #93bis, Dubrovnik, Croatia, 11th – 15th April 2016

| <b>RAN2<br/>#93bis<br/>Tdoc</b> | <b>Title</b>                                                                   | <b>Source</b>                                         | <b>Spec</b>   | <b>Spec<br/>Version#</b> | <b>CR#</b> | <b>rev</b> | <b>cat</b> | <b>Release</b> | <b>SI/WI</b>              | <b>Comment</b>               | <b>Agenda<br/>item for<br/>RAN2#94</b> |
|---------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------|---------------|--------------------------|------------|------------|------------|----------------|---------------------------|------------------------------|----------------------------------------|
| 162376                          | decoupling                                                                     |                                                       |               |                          |            |            |            |                |                           | should be corrected to cat.F |                                        |
| R2-162392                       | Steering command during T350                                                   | Samsung                                               | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core       |                              | 7.6.0                                  |
| R2-162426                       | Correction on keeping SCG upon inter eNB handover                              | Huawei, HiSilicon                                     | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_dualC_ext-Core        |                              | 7.15.0                                 |
| R2-162433                       | Clarification on WLAN measurement                                              | Huawei, HiSilicon                                     | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core       |                              | 7.6.0                                  |
| R2-162434                       | Polling for LWA status report                                                  | Huawei, HiSilicon                                     | 36.323        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core       |                              | 7.6.0                                  |
| R2-162436                       | Clarification on WLAN connection status reporting for RCLWI                    | Huawei, HiSilicon                                     | 36.300        | 13.3.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core       |                              | 7.6.0                                  |
| R2-162484                       | Clarification on the usage of threshold conditions for sidelink relay UE       | ITRI                                                  | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_eD2D_Prox-Core        |                              | 7.5.0                                  |
| R2-162537                       | Corrections to MTCe in TS 36.300                                               | Intel Corporation                                     | 36.300        | 13.3.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core         |                              | 7.4.0                                  |
| R2-162592                       | Correction on SI update for eDRX                                               | Huawei, HiSilicon                                     | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_extDRX-Core           |                              | 7.9.0                                  |
| R2-162656                       | CR on SI window combining for eMTC                                             | NTT DOCOMO INC.                                       | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core         |                              | 7.4.0                                  |
| R2-162678                       | UL UE Categories support for 64 QAM                                            | Nokia, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, INC. | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_UL64QAM               |                              | 7.15.0                                 |
| R2-162693                       | UE capability of an additional Rx and Tx requirement for a CA band combination | NTT DOCOMO, INC.                                      | 36.306        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_CA-Core, TEI13        |                              | 7.2.0                                  |
| R2-162696                       | Corrections on the data modulation of Downlink-Shared Channel                  | NTT DOCOMO INC.                                       | 36.302        | 12.6.0                   | -          | -          | F          | Rel-12         | LTE_SC_enh_L1-Core        |                              | 6.0                                    |
| <b>R2-</b>                      | <b>Corrections on the data modulation of</b>                                   | <b>NTT DOCOMO INC.</b>                                | <b>36.302</b> | <b>13.1.0</b>            | <b>-</b>   | <b>-</b>   | <b>A</b>   | <b>Rel-13</b>  | <b>LTE_SC_enh_L1-Core</b> |                              | 6.0                                    |

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| RAN2 #93bis Tdoc | Title                                                                                    | Source                                                                       | Spec   | Spec Version# | CR# | rev | cat | Release | SI/WI                                  | Comment                                          | Agenda item for RAN2#94 |
|------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------|---------------|-----|-----|-----|---------|----------------------------------------|--------------------------------------------------|-------------------------|
| 162309           | Downlink-Shared Channel                                                                  |                                                                              |        |               |     |     |     |         |                                        |                                                  |                         |
| R2-162798        | Small eSL related corrections                                                            | Samsung Telecommunications                                                   | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_eD2D_Prox-Core                     |                                                  | 7.5.0                   |
| R2-162799        | Alignment of RCLWI configuration                                                         | Samsung Telecommunications                                                   | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_WLAN_radio-Core                    |                                                  | 7.6.0                   |
| R2-162840        | Stage 2 aspects of HARQ functionality for eMTC UEs                                       | Ericsson                                                                     | 36.300 | 13.3.0        | -   | -   | F   | Rel-13  | LTE_MTCe2_L1-Core                      | The () to be removed from (M)PDCCH.              | 7.4.0                   |
| R2-162841        | Minor corrections to MAC for eMTC                                                        | Ericsson                                                                     | 36.321 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_MTCe2_L1-Core                      |                                                  | 7.4.0                   |
| R2-162868        | Clarification on maximum number of DL-SCH transport block bits for DL Category 15 and 16 | NTT DOCOMO, INC., Samsung, Nokia, Alcatel-Lucent Shanghai Bell, Fujitsu, NEC | 36.306 | 12.8.0        | -   | -   | F   | Rel-12  | LTE_CA-Core, TEI12, LTE_SC_enh_L1-Core |                                                  | 6.0                     |
|                  | Clarification on maximum number of DL-SCH transport block bits for DL Category 15 and 16 | NTT DOCOMO, INC., Samsung, Nokia, Alcatel-Lucent Shanghai Bell, Fujitsu, NEC | 36.306 | 13.1.0        | -   | -   | A   | Rel-13  | LTE_CA-Core, TEI12, LTE_SC_enh_L1-Core |                                                  | 6.0                     |
| R2-162879        | Assumption of UE radio access capabilities for skipped fallback band combinations        | NTT DOCOMO, INC.                                                             | 36.306 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_CA_enh_b5C-Core                    |                                                  | 7.2.0                   |
| R2-162971        | Support of CRS-Assistance signaling for the DL Control Channel IM                        | Intel Corporation                                                            | 36.331 | 13.1.0        | -   | -   | C   | Rel-13  | LTE_IM_DLCCH                           |                                                  | 7.15.0                  |
| R2-162981        | Support of DB-DC-HSUPA                                                                   | Qualcomm Incorporated                                                        | 25.306 | 11.10.0       | -   | -   | B   | Rel-11  | HSUPA_DB_MC-Core                       |                                                  | 10.0                    |
| R2-162982        | Support of DB-DC-HSUPA                                                                   | Qualcomm Incorporated                                                        | 25.306 | 12.7.0        | -   | -   | A   | Rel-12  | HSUPA_DB_MC-Core                       | wrong CR category used in CR cover. It should be | 10.0                    |

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| RAN2 #93bis Tdoc | Title                                                      | Source                     | Spec   | Spec Version# | CR# | rev | cat | Release | SI/WI                                           | Comment | Agenda item for RAN2#94 |
|------------------|------------------------------------------------------------|----------------------------|--------|---------------|-----|-----|-----|---------|-------------------------------------------------|---------|-------------------------|
|                  |                                                            |                            |        |               |     |     |     |         |                                                 | cat.A.  |                         |
| R2-162983        | Correction on DCH enhancements                             | Huawei, HiSilicon          | 25.300 | 12.5.0        | -   | -   | F   | Rel-12  | UTRA_DCHenh-Core                                |         | 11.0                    |
|                  | Correction on DCH enhancements                             | Huawei, HiSilicon          | 25.300 | 13.1.0        | -   | -   | A   | Rel-13  | UTRA_DCHenh-Core                                |         | 11.0                    |
| R2-162987        | Avoiding simultaneous configuration of LWA and DC for a UE | Intel Corporation          | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_WLAN_radio-Core                             |         | 7.6.0                   |
| R2-163001        | Corrections for sidelink description                       | Huawei, HiSilicon          | 36.300 | 13.3.0        | -   | -   | F   | Rel-13  | LTE_eD2D_Prox-Core                              |         | 7.5.0                   |
| R2-163002        | Miscellaneous correction for sidelink                      | Huawei, HiSilicon, ITRI    | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_eD2D_Prox-Core                              |         | 7.5.0                   |
| R2-163003        | Correction on conditions of sidelink operation             | Huawei, HiSilicon          | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_eD2D_Prox-Core                              |         | 7.5.0                   |
| R2-163004        | Corrections on sidelink related description in TS36.302    | CATT                       | 36.302 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_eD2D_Prox-Core                              |         | 7.5.0                   |
| R2-163009        | Correction on conditions of sidelink operation             | Huawei, HiSilicon          | 36.304 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_eD2D_Prox-Core                              |         | 7.5.0                   |
| R2-163024        | drb-identity change in full configuration                  | NTT DOCOMO, INC.           | 36.331 | 12.9.0        | -   | -   | F   | Rel-12  | LTE-L23, TEI12                                  |         | 6.0                     |
|                  | drb-identity change in full configuration                  | NTT DOCOMO, INC.           | 36.331 | 13.1.0        | -   | -   | A   | Rel-13  | LTE-L23, TEI12                                  |         | 6.0                     |
| R2-163025        | Configuration of LWA and LWIP upon handover                | Samsung Telecommunications | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_WLAN_radio-Core, LTE_WLAN_radio_legacy-Core |         | 7.6.0                   |
| R2-163066        | Valid subframes for FDD and TDD DL transmissions           | Ericsson                   | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_MTCe2_L1-Core                               |         | 7.4.0                   |
| R2-163067        | Corrections on nB extension                                | Huawei, HiSilicon          | 36.304 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_MTCe2_L1-Core                               |         | 7.4.0                   |
| R2-163068        | Miscellaneous eMTC corrections                             | Ericsson                   | 36.331 | 13.1.0        | -   | -   | F   | Rel-13  | LTE_MTCe2_L1-Core                               |         | 7.4.0                   |

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|---------------------------------|--------------------------------------------------------------------|-------------------------------------|-------------|--------------------------|------------|------------|------------|----------------|---------------------|----------------|----------------------------------------|
| R2-163069                       | Corrections to MTCe in TS 36.331                                   | Intel Corporation                   | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163072                       | HARQ RTT Timers in eMTC                                            | CATT                                | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163073                       | Asynchronous UL HARQ protocol operation                            | Panasonic                           | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163074                       | Correction on DL retransmission and UL transmission                | Huawei, HiSilicon                   | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163075                       | Correction to MAC procedures for MTC                               | HTC Corporation                     | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163076                       | Correction of BCCH reception for LC-MTC                            | Nokia, Alcatel-Lucent Shanghai Bell | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163077                       | Corrections to MTCe in TS 36.321                                   | Intel Corporation                   | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163078                       | Correction on frequency hopping signaling                          | Sequans Communications              | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163079                       | Correction of IE name "systemInformationBlockType1Dedicated"       | Kyocera                             | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | eICIC_enh_LTE-Core  |                | 6.0                                    |
| R2-163080                       | Clarification on the presence of ul-64QAM-r12 for DL-only bands    | Huawei, HiSilicon                   | 36.331      | 12.9.0                   | -          | -          | F          | Rel-12         | TEI12               |                | 6.0                                    |
|                                 | Clarification on the presence of ul-64QAM-r12 for DL-only bands    | Huawei, HiSilicon                   | 36.331      | 13.1.0                   | -          | -          | A          | Rel-13         | TEI12               |                | 6.0                                    |
| R2-163083                       | Corrections on capability linking for measurement object extension | Huawei, HiSilicon                   | 36.306      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_CA_enh_b5C-Core |                | 7.2.0                                  |
| R2-163084                       | Definition of a fallback band combination                          | NTT DOCOMO, INC.                    | 36.306      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_CA-Core, TEI13  |                | 7.2.0                                  |
| R2-163085                       | Some eCA related corrections                                       | Nokia, Alcatel-Lucent Shanghai Bell | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_CA_enh_b5C-Core |                | 7.2.0                                  |

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|---------------------------------|------------------------------------------------------------------|-------------------------------------|-------------|--------------------------|------------|------------|------------|----------------|--------------------------------------------------------------------------------|----------------|----------------------------------------|
| R2-163086                       | Inter-node signalling                                            | HTC Corporation                     | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_CA_enh_b5C-Core,<br>LTE_WLAN_radio-Core,<br>LTE_WLAN_radio_legacy-<br>Core |                | 7.2.0                                  |
| R2-163087                       | Clarification on SC-PTM                                          | HTC Corporation                     | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_SC_PTM-Core                                                                |                | 7.3.0                                  |
| R2-163088                       | System information acquisition for SC-PTM reception on non-PCell | Huawei, HiSilicon                   | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_SC_PTM-Core                                                                |                | 7.3.0                                  |
| R2-163089                       | MBMS reception via MBSFN or SC-PTM                               | Nokia, Alcatel-Lucent Shanghai Bell | 36.306      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_SC_PTM-Core                                                                |                | 7.3.0                                  |
| R2-163090                       | Miscellaneous Stage-2 corrections for LWA                        | Intel Corporation                   | 36.300      | 13.3.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core                                                            |                | 7.6.0                                  |
| R2-163091                       | Clarification on LWA                                             | HTC Corporation                     | 36.300      | 13.3.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core                                                            |                | 7.6.0                                  |
| R2-163092                       | Clarifications on LWA capability                                 | HTC Corporation                     | 36.306      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core                                                            |                | 7.6.0                                  |
| R2-163093                       | Addition of S-RSRP abbreviation definition                       | CATT                                | 36.300      | 12.9.0                   | -          | -          | F          | Rel-12         | LTE_D2D_Prox-Core                                                              |                | 6.0                                    |
| R2-163094                       | Corrections on conditions for sidelink discovery operation       | Huawei, HiSilicon                   | 36.304      | 12.7.0                   | -          | -          | F          | Rel-12         | LTE_D2D_Prox-Core                                                              |                | 6.0                                    |
| R2-163095                       | Corrections for SL resource configuration during handover        | Huawei, HiSilicon                   | 36.331      | 12.9.0                   | -          | -          | F          | Rel-12         | LTE_D2D_Prox-Core                                                              |                | 6.0                                    |
| R2-163096                       | Addition of S-RSRP abbreviation                                  | Huawei, HiSilicon                   | 36.331      | 12.9.0                   | -          | -          | F          | Rel-12         | LTE_D2D_Prox-Core                                                              |                | 6.0                                    |
| R2-163097                       | Corrections on RoHC description                                  | Huawei, HiSilicon                   | 36.323      | 12.5.0                   | -          | -          | F          | Rel-12         | LTE_D2D_Prox-Core                                                              |                | 6.0                                    |
|                                 | Corrections on RoHC description                                  | Huawei, HiSilicon                   | 36.323      | 13.1.0                   | -          | -          | A          | Rel-13         | LTE_D2D_Prox-Core                                                              |                | 6.0                                    |
| R2-163098                       | Corrections for sidelink description                             | Huawei, HiSilicon                   | 36.322      | 12.3.0                   | -          | -          | F          | Rel-12         | LTE_D2D_Prox-Core                                                              |                | 6.0                                    |

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|---------------------------------|------------------------------------------------|-------------------------------------|---------------|--------------------------|------------|------------|------------|----------------|----------------------------|----------------|----------------------------------------|
|                                 | <b>Corrections for sidelink description</b>    | <b>Huawei, HiSilicon</b>            | <b>36.322</b> | <b>13.1.0</b>            | <b>-</b>   | <b>-</b>   | <b>A</b>   | <b>Rel-13</b>  | <b>LTE_D2D_Prox-Core</b>   |                | 6.0                                    |
| R2-163099                       | Clarification on LWA                           | HTC Corporation                     | 36.323        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core        |                | 7.6.0                                  |
| R2-163102                       | The granularity of LWAAP entity                | Huawei, HiSilicon                   | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core        |                | 7.6.0                                  |
| R2-163103                       | WLAN measurements and user preference          | NEC                                 | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core        |                | 7.6.0                                  |
| R2-163104                       | Corrections to LWA                             | CATT                                | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core        |                | 7.6.0                                  |
| R2-163106                       | Miscellaneous RRC corrections for LWA          | Intel Corporation                   | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core        |                | 7.6.0                                  |
| R2-163107                       | The handling of WLAN status monitoring         | Huawei, HiSilicon                   | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core        |                | 7.6.0                                  |
| R2-163110                       | Renaming UE_ID used for MCLD purposes          | Nokia, Alcatel-Lucent Shanghai Bell | 36.304        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MC_load-Core           |                | 7.7.0                                  |
| R2-163111                       | Clarification of timer description for MCLD    | Kyocera                             | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MC_load-Core           |                | 7.7.0                                  |
| R2-163112                       | Clarification on DC                            | HTC Corporation                     | 36.300        | 13.3.0                   | -          | -          | F          | Rel-13         | LTE_dualC_enh-Core         |                | 7.8.0                                  |
| R2-163113                       | Corrections on Support of CRI reporting in MAC | ETRI                                | 36.321        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_EBF_FDMIMO-Core        |                | 7.10.0                                 |
| R2-163114                       | Correction to FD-MIMO field descriptions       | Ericsson                            | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_EBF_FDMIMO-Core        |                | 7.10.0                                 |
| R2-163115                       | Introducing EBF/FD-MIMO capabilities           | Samsung Telecommunications          | 36.306        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_EBF_FDMIMO-Core        |                | 7.10.0                                 |
| R2-163116                       | Small corrections to LWIP                      | Nokia, Alcatel-Lucent Shanghai Bell | 36.331        | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio_legacy-Core |                | 7.13.0                                 |

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|---------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|-------------|--------------------------|------------|------------|------------|----------------|---------------------|----------------|----------------------------------------|
| R2-163131                       | Introducing EBF/FD-MIMO capabilities                                                  | Samsung Telecommunications          | 36.331      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_EBF_FDMIMO-Core |                | 7.10.0                                 |
| R2-163132                       | Clarification regarding IDC indication upon change of UL CA affecting GNSS            | Samsung Telecommunications          | 36.331      | 11.15.0                  | -          | -          | F          | Rel-11         | SPIA_IDC_LTE-Core   |                | 6.0                                    |
|                                 | Clarification regarding IDC indication upon change of UL CA affecting GNSS            | Samsung Telecommunications          | 36.331      | 12.9.0                   | -          | -          | A          | Rel-12         | SPIA_IDC_LTE-Core   |                | 6.0                                    |
|                                 | Clarification regarding IDC indication upon change of UL CA affecting GNSS            | Samsung Telecommunications          | 36.331      | 13.1.0                   | -          | -          | A          | Rel-13         | SPIA_IDC_LTE-Core   |                | 6.0                                    |
| R2-163138                       | Clarification for UE behaviour upon reception of requested E-UTRA frequency band list | Nokia, Alcatel-Lucent Shanghai Bell | 25.331      | 10.19.0                  | -          | -          | F          | Rel-10         | TEI10               |                | 4.1.0                                  |
|                                 | Clarification for UE behaviour upon reception of requested E-UTRA frequency band list | Nokia, Alcatel-Lucent Shanghai Bell | 25.331      | 11.16.0                  | -          | -          | A          | Rel-11         | TEI10               |                | 4.1.0                                  |
|                                 | Clarification for UE behaviour upon reception of requested E-UTRA frequency band list | Nokia, Alcatel-Lucent Shanghai Bell | 25.331      | 12.9.0                   | -          | -          | A          | Rel-12         | TEI10               |                | 4.1.0                                  |
|                                 | Clarification for UE behaviour upon reception of requested E-UTRA frequency band list | Nokia, Alcatel-Lucent Shanghai Bell | 25.331      | 13.2.0                   | -          | -          | A          | Rel-13         | TEI10               |                | 4.1.0                                  |
| R2-163139                       | Starting CE level for PDCCH order and HO                                              | Ericsson                            | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163141                       | Correction on preamble group selection and RA-RNTI value range                        | Huawei, HiSilicon                   | 36.321      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |
| R2-163143                       | Clarification of LWA status report                                                    | MediaTek Inc.                       | 36.323      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_WLAN_radio-Core |                | 7.6.0                                  |
| R2-163144                       | The improvements for the representation of eMTC features                              | Huawei, HiSilicon                   | 36.302      | 13.1.0                   | -          | -          | F          | Rel-13         | LTE_MTCe2_L1-Core   |                | 7.4.0                                  |

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## Annex F: RAN WG2 meeting #93bis post processing

### Email discussions/approvals

Rapporteur companies are requested to kick-off email discussions as soon as possible via the RAN2 email reflector. Important: In the beginning of the subject of each email the corresponding identifier [...] of the email discussion has to be used in order to allow sorting of the different email discussions.

Email discussions with finalisation by Thu 21.04.2016 midnight Pacific time, i.e. Fri 22.04.2016 9am CEST:

[93bis#01][LTE/Latred SI] Update TR 36.881 (Ericsson)

- Intended outcome: Updated TR with RAN1 agreements.
- Deadline: Thursday 21/04/2016
- conclusion: Email discussion was kicked off by Henrik Enbuske (Ericsson) on 18.04.2016.  
TR 36.881 v0.6.1 was agreed in R2-163010 and clean version v0.7.0 produced in R2-163011 on 25.04.2016.

[93bis#02][LTE/eLAA] Running stage 2 CR (Huawei)

- Capture agreements in running stage 2 CR
- Intended outcome: Endorsed running CR
- Deadline: Thursday 21/04/2016
- conclusion: Email discussion was kicked off by Yi Guo (Huawei) on 19.04.2016.  
36.300 draftCR R2-162997 was endorsed on 23.04.2016.

[93bis#03][NB-IOT] LS to SA3 (ZTE)

- Intended outcome: Approved LS
- Deadline: Thursday 21/04/2016
- conclusion: Email discussion was kicked off by Sergio Parolari (ZTE) on 18.04.2016.  
The LS R2-163129 was approved on 22.04.2016.

[93bis#04][LTE/V2V] Running 36.300 – LG

- Capture agreements from RAN2#93bis
- Intended outcome: Endorsed running 36.300
- Deadline: Thursday 21/04/2016
- conclusion: Email discussion was kicked off by Jaewook Lee (LGE) on 18.04.2016.  
36.300 draftCR R2-162998 was endorsed on 22.04.2016.

Email discussions with finalisation by Thu 28.04.2016 midnight Pacific time, i.e. Fri 29.04.2016 9am CEST:

[93bis#05][LTE/MTC/NB-IOT] NAS timer extension (Ericsson)

- Discuss the proposal in R2-162996 related to different timer value usage depending on UE coverage situation.
- Discuss in the scope of MTC and NB-IOT
- Information may be provided to CT1, during their CIOT ad hoc, if the discussion converges by 26/04/2016
- Intended outcome: Email discussion report to NB-IOT ad-hoc
- Deadline: Thursday 28/04/2016
- conclusion: Email discussion was kicked off by Håkan Palm L (Ericsson) on 21.04.2016.  
The summary of email discussion, R2-163245 was submitted to NB-IoT AH#2 on 02.05.2016.

[93bis#06][LTE/eDRX/NB-IOT] eDRX paging solution (Ericsson)

- To find solution to the problem identified in R2-162806 and potentially discuss other issues identified.
  - Intended outcome: Email discussion report and draft CR
  - Deadline: Thursday 28/04/2016
- conclusion: Email discussion was kicked off by Håkan Palm L (Ericsson) on 20.04.2016.  
The result of email discussion provided in [R2-164169](#) to RAN2#94.

[93bis#07][NB-IOT] RACH open issues (ZTE)

- Open issues from R2-162331 and R2-162360 on a) PRACH configuration including PDCCH Period b) Necessary Updates to RA-RNTI formula and RAR contents, c) BI value definition/mapping
  - Intended outcome: Email discussion report to NB-IOT ad-hoc
  - Deadline: Thursday 28/04/2016
- conclusion: Email discussion was kicked off by Sergio Parolari (ZTE) on 21.04.2016.  
The result of email discussion provided in [R2-163251](#) to NB-IoT AH#2.

[93bis#08][NB-IOT] t-reordering (DOCOMO)

- Discussion on t-reordering, on how to achieve the desired RLC behaviour
  - Intended outcome: Email discussion report to NB-IOT ad-hoc
  - Deadline: Thursday 28/04/2016
- conclusion: Email discussion was kicked off by Toru Uchino (NTT DOCOMO) on 18.04.2016.  
The result of email discussion provided in [R2-163217](#) to RAN2#94.

[93bis#09][NB-IOT] Timers including impact to NAS timers (Huawei)

- Discuss AS timer issues for NB-IOT.
  - Discuss NAS timers values for NB-IOT (appropriate NAS timers values for NB-IoT might be different than eMTC due to the different physical layer design). Note the principle of whether to apply different NAS timer values depending on UE coverage situation is discussed commonly with MTC as part of email discussion #05.
  - Information may be provided to CT1, during their CIOT ad hoc, if the discussion converges by 26/04/2016
- Intended outcome: Email discussion report to NB-IOT ad-hoc
- Deadline: Thursday 28/04/2016
- conclusion: Email discussion was kicked off by Yang Zhao (Huawei) on 21.04.2016.  
The result of email discussion provided in [R2-163222](#) to NB-IoT AH#2.

[93bis#10][NB-IOT] CR to 36.300 (Huawei)

- Intended outcome: Endorsed running CR
  - Deadline: Thursday 28/04/2016
- conclusion: Email discussion was kicked off by Emmy (Huawei) on 21.04.2016.  
The result of email discussion provided in [R2-163218](#) to NB-IoT AH#2.  
Then, email discussion extended to capture agreements in NB-IoT AH#2 and the result provided in [R2-164287](#) to RAN2#94.

[93bis#11][NB-IOT] CR to 36.304 (Nokia)

- Intended outcome: Endorsed running CR
  - Deadline: Thursday 28/04/2016
- conclusion: Email discussion was kicked off by Jussi-Pekka Koskinen (Nokia Networks) on 21.04.2016.  
The result of email discussion provided in [R2-163244](#) to NB-IoT AH#2.  
Then, email discussion extended to capture agreements in NB-IoT AH#2 and the result provided in [R2-163870](#) to RAN2#94.

[93bis#12][NB-IOT] CR to 36.321 (Ericsson)

- Intended outcome: Endorsed running CR
- Deadline: Thursday 28/04/2016

conclusion: Email discussion was kicked off by Bela Rathonyi (Ericsson)  
on 21.04.2016.  
The result of email discussion provided in [R2-163259](#) to NB-IoT AH#2.

[93bis#13][NB-IOT] CR to 36.322 (NTT Docomo)

- Intended outcome: Endorsed running CR
- Deadline: Thursday 28/04/2016

conclusion: Email discussion was kicked off by Toru Uchino (NTT DOCOMO)  
on 18.04.2016.  
The result of email discussion provided in [R2-163216](#) to NB-IoT AH#2.  
Then, email discussion extended to capture agreements in NB-IoT AH#2 and  
the result provided in [R2-164283](#) to RAN2#94.

[93bis#14][NB-IOT] CR to 36.323 (Qualcomm)

- Intended outcome: Endorsed running CR
- Deadline: Thursday 28/04/2016

conclusion: Email discussion was kicked off by Mungal Dhanda (Qualcomm)  
on 20.04.2016.  
The result of email discussion provided in [R2-163238](#) to NB-IoT AH#2.  
Then, email discussion extended and  
the result provided in [R2-164297](#) to RAN2#94.

[93bis#15][NB-IOT] CR to 36.302 (Huawei)

- Intended outcome: Endorsed running CR
- Deadline: Thursday 28/04/2016

conclusion: Email discussion was kicked off by Nathan Tenny (Huawei)  
on 21.04.2016.  
The result of email discussion provided in [R2-163219](#) to NB-IoT AH#2.  
Then, email discussion extended to capture agreements in NB-IoT AH#2 and  
the result provided in [R2-164288](#) to RAN2#94.

[93bis#16][NB-IOT] CR to 36.306 (Ericsson)

- Intended outcome: Endorsed running CR
- Deadline: Thursday 28/04/2016

conclusion: Email discussion was kicked off by Martin VAN DER ZEE (Ericsson)  
on 21.04.2016.  
The result of email discussion provided in [R2-163241](#) to NB-IoT AH#2.  
Then, email discussion extended to capture agreements in NB-IoT AH#2 and  
the result provided in [R2-163902](#) to RAN2#94.

[93bis#17][NB-IOT] CR to 36.331 (Huawei)

- Intended outcome: Endorsed running CR to capture agreements from RAN2#93bis, and  
list of open ASN.1 and procedural issues to be discussed during the NB-IOT ad-hoc.
- Deadline: Thursday 29/04/2016 (note, date different from section heading)

conclusion: Email discussion was kicked off by Odile Rollinger (Huawei)  
on 21.04.2016.  
The result of email discussion provided in [R2-163221](#) to NB-IoT AH#2.  
Then, email discussion extended to capture agreements in NB-IoT AH#2 and  
the result provided in [R2-164289](#) to RAN2#94.

Email discussions with finalisation by Thu 05.05.2016 midnight Pacific time, i.e. Fri 06.05.15 9am CEST:

[93bis#18][LTE/HPUE] LS from RAN4 R2-162991 (Sprint)

- Discuss whether the proposed signalling is beneficial and if so decide on the impact to  
RAN2 specs and potential release of any change. Information to be provided to RAN4 by  
LS from next meeting. Could draft LS depending on progress of email.
- Intended outcome: Report and potential LS to next meeting.
- Deadline: Thursday 05/05/2016

conclusion: Email discussion was kicked off by Scott Migaldi (Sprint)  
on 18.04.2016.  
The result of email discussion provided in [R2-163350](#) to RAN2#94.

[93bis#19][LTE/Rel-13] TDD/FDD capabilities (Huawei)

- Discuss the need to differentiate FDD/TDD capabilities for those capabilities added in Rel-13.
  - Intended outcome: Email discussion report and draft CR to next meeting  
Deadline: Thursday 05/05/2016
- conclusion: Email discussion was kicked off by Jeff Gao (Huawei)  
on 27.04.2016.

The result of email discussion provided in [R2-163919](#) to RAN2#94.

[93bis#20][LTE/LWI] State transitions (Samsung)

- Discuss state transitions (related to R2-162388)
  - Intended outcome: Email discussion report and potentially draft CR to the next meeting.
  - Deadline: Thursday 05/05/2016
- conclusion: Email discussion was kicked off by Jaehyuk Jang (Samsung)  
on 20.04.2016.

The result of email discussion provided in [R2-163653](#) to RAN2#94.

[93bis#21][LTE/Unattended data] 36.331 CR (Verizon)

- Intended outcome: Agreeable CR to the next meeting
  - Deadline: Thursday 05/05/2016
- conclusion: Email discussion was kicked off by Yee Sin Chan (Verizon)  
on 28.04.2016.

The result of email discussion provided in [R2-164284](#) to RAN2#94.

[93bis#22][NR] TR skeleton structure (DOCOMO)

- Discuss skeleton structure for RAN2 NR TR
  - Intended outcome: Draft skeleton to next meeting
  - Deadline: Thursday 05/05/2016
- conclusion: Email discussion was kicked off by Hideaki Takahashi (NTT DOCOMO)  
on 22.04.2016.

The result of email discussion provided in [R2-163543](#) to RAN2#94.

[93bis#23][NR] Deployment scenarios (DOCOMO)

- Aim to identify deployment scenarios that can be captured in the TR.
  - Intended outcome: Email discussion report to next meeting
  - Deadline: Thursday 05/05/2016
- conclusion: Email discussion was kicked off by Hideaki Takahashi (NTT DOCOMO)  
on 22.04.2016.

The result of email discussion provided in [R2-163969](#) to RAN2#94.

[93bis#24][LTE/V2V] Tx PC5 and Uu path switch for V2V – Huawei

- Identify need/use cases and whether there is something that has to be done
  - Identify key aspects to address and gather companies views/solutions on these aspects and main benefits of the solutions. Solutions should be limited to the ones proposed in papers in this meeting.
  - Intended outcome: Capture conclusions/proposal for RAN2#94
  - Deadline: 6th of May for company inputs and May 9 circulate conclusions of the email discussion (note, dates different from section heading)
- conclusion: Email discussion was kicked off by zhenzhen Cao (Huawei)  
on 24.04.2016.

The result of email discussion provided in [R2-163815](#) to RAN2#94.

[93bis#25][LTE/V2V] Mobility for V2V – Intel

- Capture the solutions proposed to limit Rx (mode 1 and 2) and Tx mode 1 PC5 interruption time for handover case and pros/cons of each solution. Solutions are limited to the ones proposed in documents submitted to RAN2#93bis.
- Discuss whether cell reselection needs to be optimized. No solutions to be discussed at this stage.
- Discuss what happens in RLF/HO failure case (mode 1 and mode 2).
- Intended outcome: Capture conclusions for RAN2#94
- Deadline May 6th to gather all company inputs. May 9th circulate conclusions. (note, dates different from section heading)

conclusion: Email discussion was kicked off by Kyeongin Jeong (Intel)  
on 03.05.2016.  
The result of email discussion provided in [R2-163620](#) to RAN2#94.

[93bis#26][LTE/V2X] – TP capturing RAN2 agreements (LG)

- Intended outcome: Agreeable TP capturing RAN2 agreements
- Deadline: Thursday 05/05/2016

conclusion: Email discussion was kicked off by Jaewook Lee (LGE)  
on 27.04.2016.  
The result of email discussion provided in [R2-163650](#) to RAN2#94.

[93bis#27][LTE/eVoLTE] Identify the potential problems from signalling aspect (Huawei)

- Based on the content of R2-162648 and R2-162473
- Intended outcome: Discussion report to the next meeting
- Deadline: Thursday 05/05/2016

conclusion: Email discussion was kicked off by Yi Guo (Huawei)  
on 28.04.2016.  
The result of email discussion provided in [R2-164263](#) to RAN2#94.

[93bis#28][LTE/Mobility enhancement] Discussion on solution 2 family (ZTE)

- Including the options proposed in R2-162719 and R2-162232.
- Including the requirements of each options
- Including the data forwarding issue.
- Including the solutions mentioned in R2-162963 and R2-162411.
- Identify the use scenario for each solution (e.g., SCG change or handover...)
- Reuse the Table I and the concept of phase in R2-162232
- Intended outcome: clear details of each solutions including the bullets above. The outcome will be used to further down-selection.
- Deadline: Thursday 05/05/2016

conclusion: Email discussion was kicked off by Yumin Wu (ZTE)  
on 27.04.2016.  
The result of email discussion provided in [R2-163863](#) to RAN2#94.

[93bis#29][LTE/eVoLTE] TR skeleton and capturing agreements (CMCC)

- One week to develop the structure of the TR skeleton
- Until next meeting capture the agreements from this meeting into the TR
- Intended outcome: Agreed TR version 0.1.0
- Deadline: Thursday 05/05/2016

conclusion: Email discussion was kicked off by Chen Zhuo (CMCC)  
on 19.04.2016.  
draft TR 36.750 v0.0.3 [R2-163027](#) was agreed and  
clean version v0.1.0 [R2-163028](#) was provided on 26.04.16.  
Further update based on v0.1.0 provided in [R2-163717](#) to RAN2#94.

Email discussions with finalisation by Thu 12.05.2016 midnight Pacific time, i.e. Fri 13.05.15 9am CEST:

[93bis#30][LTE/CIOT opt] Stage 3 CR (Ericsson)

- Details of the CR should be based on the NB-IOT CRs.  
Intended outcome: Draft CR to next meeting and identification of any remaining issues for discussion.
- Deadline: Thursday 12/05/2016

conclusion: Email discussion was kicked off by Riikka Susitaival (Ericsson)  
on 02.05.2016.  
The result of email discussion provided in [R2-164171](#) to RAN2#94.

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## Annex G:

### LTE Breakout session: V2V, V2X, FeD2D, LATRED

On Monday and Thursday of RAN2 #93bis, in parallel to the main LTE session, an LTE Breakout session on V2V, V2X, FeD2D and LATRED session was held in room (Gregale/Zephyros) chaired by RAN2 vice-chairman Diana Pani (Interdigital) addressing:

On Monday:

7.5 LTE: Rel-13: WI: ProSe enhancements

8.4 LTE: Rel-14: SI: Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables

On Tuesday:

8.4 LTE: Rel-14: SI: Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables

8.2 LTE: Rel-14: WI: Support for V2V services based on LTE sidelink

8.11 LTE: Rel-14: SI: Feasibility Study on LTE-based V2X Services

On Thursday:

8.10 LTE: Rel-14: SI: Study on Latency reduction techniques for LTE

The corresponding report of this session [R2-163056](#) was presented and approved on Friday and the contents is provided in this Annex G for convenience reasons.

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## 7.5 WI: ProSe enhancements

(LTE\_eD2D\_Prox-Core, leading WG: RAN2, REL-13; started: Dec. 14, closed: Mar. 16, WID: [RP-150441](#))

WI complete from RAN2 perspective

Documents in this agenda item handled in the LTE Break Out session

### 36.300

[R2-162156](#) Corrections for sidelink description Huawei, HiSilicon draftCR 36.300 13.3.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core

- Ericsson thinks that the change in section 8.3 is not needed. Qualcomm thinks that the change is ok
- Ericsson wonders if in section 23.10.2.2 we would need to list all different cases, it would be difficult to maintain. ZTE thinks that we can generalize

=> in section 23.10.2.2 change to releasing and delete TMGI monitoring requests, Cell ID announcement requests and keep captions of Figure 23.10.2.2-2 as legacy text

- Nokia Net wonder if we should be more specific than just saying public safety sidelink discovery, is group member discovery only restricted to PS carrier. Qualcomm doesn't think there is a need to add anything else and yes it is.

=> The CR is agreed in principle in [R2-163001](#) with the changes above

[R2-162511](#) Miscellaneous corrections for sidelink in 36.300 ZTE Corporation draftCR 36.300 13.3.0- - F Rel-13 LTE\_eD2D\_Prox-Core

- The editorial changes in 23.11.3 will be merged in [R2-163001](#).

=> The CR is not pursued

### 36.331

[R2-162798](#) Small eSL related corrections Samsung Telecommunications draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core

- Interdigital thought that priorities is only for mode 2. Qualcomm thinks that we give priority with the LCG. Interdigital indicates that it is another IE, logical channel info list. Ericsson thinks that the proposed changes are correct.
- Huawei thinks it should priority list.

=> the CR is agreed in principle

- [R2-162155](#) Miscellaneous correction for sidelink Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Nokia Net thinks that maybe having a second block of text on *discConfigPS*. Ericsson thinks that this would result in the same action and specs. Qualcomm thinks that the changes are fine and the UE should know to use PS pools.
  - Nokia Net would like to understand why the change in 5.3.3.1a is needed. Qualcomm doesn't think it is needed, the UE is already acting as a relay.
  - Ericsson thinks that if the UE is acting as sidelink relay UE it should already be connected.
- => In 5.3.3.1a The first check is "if *SystemInformationBlockType19* is broadcast by the cell on which the UE camps and includes *discConfigRelay*" is not needed
- Huawei thinks for relay operation the UE should move to connected no matter what pool is being broadcasted
- => 5.3.3.1a Second addition discuss offline [CB]
- In 5.3.3.1a Nokia Net thinks that we should rename the IE to be specific to discovery interfrequency instead of *discTxPoolCommon-r12*; Ericsson thinks that it is addressed in the next paragraph.
  - ZTE thinks that we shouldn't include all information in 5.10.2.1. QC and Ericsson thinks that it should be mentioned as it was an new introduction.
- => 5.10.2.1 just put "or sidelink discovery gaps"
- => in section 10.5.4 change and/or to "or"
- => check if in section 5.10.6 the pool IE name is actually UE-selected or if we should refer to a new IE [CB]
- Ericsson wonders what we do with all the CRs. It may be good to combine to avoid clashes.
- => We will do it case by case
- => The CR is revised in [R2-163002](#)
- [R2-163002](#) Miscellaneous correction for sidelink Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core [CB]
- [R2-162157](#) Corrections for sidelink communication transmission Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Qualcomm thinks that this is just re-writing the existing agreement.
- [CB]
- [R2-162217](#) Corrections on description of commTxAllowRelayCommon CATT draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Nokia Net thinks that commTxAllowRelayCommon is only for the relay UE. CATT thinks that the intention is that the remote UE can only use the common pool, not the relay. Ericsson thinks that the IE is for both.
- => The intention is that the commonTxRelaypool is used for the remote UE only.
- [CB on how this should be capture if it at all]
- [R2-162218](#) Correction on the conditions for sidelink operation CATT draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Ericsson wonders why we assume that 24.334 is the right way of doing.
- => This is already covered in [R2-162162](#)
- => The CR is not pursued
- [R2-162883](#) Signalling of priorityList-r13 Nokia, Alcatel-Lucent Shanghai Bell draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Ericsson and QC thinks this is an optimization.
  - Nokia Net wonders if the intention is then that the eNB has to then list all priorities. Qualcomm thinks that this can be one option or the eNB can list whichever priority it wants. Panasonic indicates that in the MAC if you have only one pool the UE doesn't check for priority. Nokia Net thinks that if that is the case some clarification could be useful.
- => The CR is not pursued
- [R2-162510](#) Miscellaneous corrections for sidelink in 36.331 ZTE Corporation draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- => Change in 5.10.6b is not needed
- => All other changes are acceptable and will be merged in [R2-163002](#)

- [R2-162513](#) Correction on Relay UE serving multiple sidelinks for one Remote UE ASUSTEK COMPUTER (SHANGHAI), CATT, Coolpad, ITL, LG Electronics, Panasonic, Qualcomm draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Intel and Ericsson doesn't see the need for this. Intel also thinks is a theoretical case. Asustek indicates that we agreed that this scenario exists.
  - Nokia Net thinks that we agreed that we can handle it in a non optimal way so this is not an essential change.
  - Ericsson thinks that the interoperability "the network behaviour is not clear" is not an acceptable explanation.
  - Asustek wonders if we can minute an understanding. Ericsson wouldn't like to see such a thing specified in the minutes. LG thinks that Asustek's suggestion is acceptable and we should capture that there is no restriction on whether the UE can send the same destination multiple times in the list.
  - Ericsson thinks that the original feature was designed for a different feature and not for the multiple PDN connection case. We agreed that we support it but not in an optimal way. If we were to make it optimal then why should we do it this way? We could have done it another way
  - Asustek wonders if the UE can send the destination multiple times. Panasonic thinks that it is possible, because it is not prohibited, it is just a matter of how the eNB handles it. Ericsson thinks that this was not prohibited because we didn't think that was possible.
- => The CR is postponed
- [R2-162158](#) Discussion on conditions for Relay and Remote UE operation Huawei, HiSilicon discussion *Proposal: the Remote UE should be allowed to perform Remote UE operation if it is out of coverage of PS carrier and does not detect any suitable cell*
- CATT supports this.
  - Ericsson thinks that this is a closed work item. Qualcomm thinks that we should just capture it in stage 2 only.
- => Noted
- [R2-162159](#) Correction on conditions for Relay and Remote UE operation Huawei, HiSilicon draftCR 36.300 13.3.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- => We will capture in stage 2 only that only single carrier operation for both relay UE and remote UE is allowed. Need to work on the wording.
- => The CR is postponed
- [R2-162160](#) Correction on conditions for Relay and Remote UE operation Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- => The CR is postponed
- [R2-162161](#) Discussion on conditions of sidelink operation Huawei, HiSilicon discussion
- Nokia Net wonders what "other" PLMN means. Huawei indicates that this means authorized
- => Noted
- [R2-162162](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Intel wonders what is the difference between a and b. Huawei indicates that one is equivalent PLMN and for discovery it is other authorized PLMN. QC supports these changes.
  - Intel wonders if the registered should be authorized. QC thinks it is and it is clear in 24.334
  - Ericsson and Samsung things that there are a few other sections that should reference 24.333
- => We will add the missing sections as well
- => Revised in [R2-163003](#)
- [R2-163003](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core [CB]
- [R2-162163](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.304 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- => conditions in 4.3 should be "or"
- Ericsson wonders if we should have a note that for reception we agreed to not specify.
- => Add a note in 11.2 that discovery reception in idle mode is up to UE implementation
- => the CR is revised in [R2-163009](#)

- [R2-163009](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.304 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core  
[CB]
- [R2-162164](#) Discussion on sidelink discovery transmission range Huawei, HiSilicon discussion  
- Qualcomm shares the same understanding.  
- Intel wonders why long should be used. Huawei thinks that long makes sense. Intel, Ericsson, and Samsung thinks that application layer can just pick long as it is public safety. Huawei thinks that the application layer doesn't tell the UE anything.  
- Nokia Net wonders if application layer can pick anything  
- Chair thinks that we should handle it in CT1 so we are consistent  
- Huawei wonders if we should have a default value if the application layer doesn't provide a value. Qualcomm indicates that in Rel-12 we would always get a value as part of the authorization  
=> RAN2 understanding is that the discovery range should be provided by higher layer for public safety similar to non-public safety discovery case  
=> Noted
- [R2-162165](#) Correction on sidelink discovery transmission range Huawei, HiSilicon draftCR 36.300  
13.3.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
=> Not treated
- [R2-162166](#) Correction on sidelink discovery transmission range Huawei, HiSilicon draftCR 36.331  
13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
=> Not treated
- [R2-162481](#) Conditions of RRC connection initiation for relay discovery ITRI draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core  
=> The CR is agreed in principle and merged into [R2-163002](#)
- [R2-162482](#) AS-conditions for relay PS related sidelink discovery trans ITRI draftCR 36.331 13.1.0-  
- F Rel-13 LTE\_eD2D\_Prox-Core  
=> The CR is agreed in principle and merged into [R2-163002](#)
- [R2-162484](#) Clarification on the usage of threshold conditions for sidelink relay UE ITRI draftCR  
36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
=> The CR is agreed in principle
- [R2-162172](#) Discussion on carrier priority handling for sidelink relay discovery Huawei, HiSilicon discussion  
*Proposal 1: If the UE capable of relay discovery is configured to perform relay discovery and can only perform the relay discovery while camping on particular a frequency, the UE may consider that frequency to be the highest priority.*  
- Intel wonder why this is restricted to relay discovery. Huawei explains that for group discovery the UE can do multicarrier, but for relay it is restricted to single carrier. Intel thinks PS discovery also has the single carrier restriction as communication. Qualcomm thinks that for non-relay PS discovery they UE has other mechanisms such as using the gaps.  
- Ericsson thinks that this is already supported as this is the case for communication and they support the idea.  
=> For PS discovery the cell selection/reselection prioritization follows the same rules as PS communications  
=> Noted
- 36.302**
- [R2-162242](#) Corrections on sidelink related description in TS36.302 CATT draftCR 36.302 13.1.0- -  
F Rel-13 LTE\_eD2D\_Prox-Core  
- Interdigital thinks that the first change is not needed as if the UE supports communication it also supports discovery.  
=> delete these changes "and for UE supporting public safety related sidelink discovery"  
=> all the notes will be updated "Depending on the UE capability, the UE may be able to perform simultaneous Uplink and Sidelink transmissions. If the UE is unable to perform simultaneous Uplink and Sidelink transmissions, transmissions are prioritized according to 36.321 [x]"

=> update the cover page to indicate that there is no inter-operability problem  
=> the CR is revised in [R2-163004](#)

[R2-163004](#) Corrections on sidelink related description in TS36.302 CATT draftCR 36.302 13.1.0- -  
F Rel-13 LTE\_eD2D\_Prox-Core  
[CB]

[R2-162167](#) Correction for sidelink Huawei, HiSilicon draftCR 36.302 13.1.0- - F Rel-13  
LTE\_eD2D\_Prox-Core  
=> The CR is agreed in principle

### 36.306

[R2-162168](#) Correction for sidelink capability Huawei, HiSilicon draftCR 36.306 13.1.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core  
- Ericsson wonders why we are adding the measurement part.  
- Qualcomm doesn't think that this has to be specified in the capability.  
=> The CR is not pursued

[R2-162533](#) Clarification on the eD2D capability Intel Corporation discussion Rel-  
13 LTE\_eD2D\_Prox-Core  
=> Noted

[R2-162534](#) Clarification on the eD2D capability Intel Corporation draftCR 36.306 13.1.0- - F  
Rel-13 LTE\_eD2D\_Prox-Core  
=> Impact analysis needs to be added  
- Nokia Net thinks that it shouldn't be just for out-of-coverage but for PS  
=> The intention of the CR is agreeable and a PS discovery UE should always support  
discontinuousSLSS  
=> The CR is postponed

### 36.323

[R2-162169](#) Correction for sidelink Huawei, HiSilicon draftCR 36.323 13.1.0- - F Rel-13  
LTE\_eD2D\_Prox-Core  
- Ericsson wonders if we should have an impact analysis between UEs  
=> As a way forward RAN2 thinks that the impact analysis for Rel-12/Rel-13 CRs concerning  
user plane specification will be included in the cover page  
=> The CR is agreed in principle

### 36.321

[R2-162170](#) Discussion on sidelink logical channel prioritization Huawei, HiSilicon discussion  
- Panasonic thinks that all these behaviours are already agreed. InterDigital also doesn't  
think there are any changes needed. The behaviour of having more than one source IDs  
in one MAC PDU is already prohibited by the MAC header. Ericsson doesn't think that  
any changes are needed.  
=> Noted

[R2-162171](#) Corrections for sidelink logical channel prioritization Huawei, HiSilicon draftCR 36.321  
13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
- Qualcomm thinks that because multiple source IDs can exist the Source Layer-2 ID-  
Destination Layer-2 ID pair this becomes an important problem to solve.  
- Ericsson thinks the text is correct according to the agreements we have made so far  
- Intel wonders if for each SCI transmitted in an SC period covers overlapping cases.  
Panasonic thinks so.  
=> the CR is postponed

[R2-162245](#) Clarification on UE behavior when tx gap is overlapped with DL subframe CATT discussion  
- Qualcomm has analysed this and thinks that the eNB can handle by implementation  
=> No support for the proposals  
=> Noted

[R2-162247](#) Clarification on UE behavior when tx gap is overlapped with DL subframe CATT draftCR  
36.321 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
- Qualcomm thinks that the change is only applicable for TDD case and in that case the UE  
can request for that TTI a DL gap.  
- Huawei and InterDigital support. InterDigital thinks that we have specified this in stage 2.

- CATT thinks that we should at least capture that the UE should request a rx gap with the tx gap. Ericsson doesn't think we should capture anything as the eNB can also do it.
- => The CR is not pursued

[R2-162337](#) UL SPS operation during Sidelink Discovery gap Panasonic discussion  
=> Not treated

[R2-162339](#) UL HARQ Protocol operation during Sidelink discovery gap Panasonic discussion  
=> Not treated

[R2-162527](#) UL SPS and Sidelink discovery gap Panasonic draftCR 36.321 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
=> The intention of the CR seems ok but need to think of the wording  
=> The CR is postponed

[R2-162528](#) Clarification on UL SPS during sidelink gap Innovative Technology Lab Co. draftCR 36.321 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
=> The CR covers similar subject as 2527 and can be discussed together  
=> The CR is not pursued

[R2-162248](#) Change the Group destination ID to Destination layer-1 ID CATT draftCR 36.300 13.3.0- - F Rel-13 LTE\_eD2D\_Prox-Core  
=> the CR is not pursued

[R2-162249](#) Change the Group destination ID to Destination layer-1 ID CATT draftCR 36.321 13.1.0- - F Rel-14 LTE\_eD2D\_Prox-Core  
=> not treated

[R2-162244](#) LS on Group Destination ID CATT LS out Rel-13 LTE\_eD2D\_Prox-Core  
=> not treated

**Withdrawn:**

[R2-162305](#) Small eSL related corrections Samsung Telecommunications CR 36.331 13.1.02115 - F Rel-13 LTE\_eD2D\_Prox-Core

[R2-162338](#) UL SPS and Sidelink discovery gap Panasonic CR 36.321 13.1.00855 - F Rel-13 LTE\_eD2D\_Prox-Core

[R2-162403](#) Miscellaneous corrections for sidelink in 36.331 ZTE Corporation CR 36.331 13.1.02118 - F Rel-13 LTE\_eD2D\_Prox-Core

[R2-162404](#) Corrections on description of PC5 control plane in 36.300 ZTE Corporation CR 36.300 13.3.00864 - F Rel-13 LTE\_eD2D\_Prox-Core

[R2-162489](#) Clarification on UL SPS during sidelink gap Innovative Technology Lab Co. CR 36.321 13.1.00856 - F Rel-13 LTE\_eD2D\_Prox-Core

## 8.2 WI: Support for V2V services based on LTE sidelink

(LTE\_SL\_V2V-Core; leading WG: RAN1; started: Dec. 15; target: Sept 16; WID: [RP-160649](#))

Time budget: 1.5 TU

Documents in this agenda item handled in the LTE Break Out session

### 8.2.1 Resource allocation

Resource allocation and scheduling related aspects, including possible enhancements, handling of resources pools, etc.

**Incoming LS:**

[R2-162105](#) LS on Geo Information Resource Mapping ([R1-161312](#); cocontact: Qualcomm) RAN1 LS in to: RAN2 Rel-14 LTE\_SL\_V2V-Core  
*moved from 3.2*

- Panasonic wonders if we should also consider mode 1. Qualcomm thinks that we should consider both mode 1 and mode 2. UE reports and it is up to the eNB to use this information for mode 2. Ericsson also thinks that the LS is for mode 2 and wonders how the information is used by the eNB.
- Ericsson thinks that for mode 1 we will use the geographical report.

=> Noted

**Geo information**

[R2-162287](#) Mode2 Resource Configuration based on Geo Information Huawei, HiSilicon discussion

- InterDigital wonders why we can use the relative case for out-of-coverage. Huawei thinks that we should have a common solution
- Chair thinks that the intention is to minimize the information to store
- Intel wonders why for proposal 4 the UE doesn't directly report the geo location
- Ericsson thinks we should understand the overhead of these pools and Nokia agrees and with respect to number of pools we should consult RAN1. Huawei thinks that we don't need to configure too many pools, maybe just two and that would double the number. InterDigital agrees that the number of pools don't have to increase so much as they can be reused in another area. Ericsson to minimize signalling we consider pre-configuring the pools. Huawei wonders if that means that even in coverage the UE will use the preconfigured.
- ZTE thinks that we should also consider speed. Huawei thinks if it moves it can just select a new resource.
- LG wonders if mode 1 is considered. Huawei clarifies that it only addresses mode 2.

=> Noted

[R2-162813](#) UE Feedbacks for V2X Ericsson discussion

- Panasonic wonders how many references the eNB would have to broadcast. Ericsson thinks we should first discuss on the size of the report.
- LG wonders if reading the reference would delay the report if it moves to the target cell.
- Intel wonders how often should the UE report. Ericsson indicates that RAN1 concluded it is in on a second basis. LG agrees but also thinks that we may need even triggered report
- Huawei wonders what the size is of UE location information. Ericsson clarifies that it is 50 bits. Huawei, Intel think that 50bits per second doesn't justify optimizations. Qualcomm thinks that in addition to the optimization we would also have to account for broadcast signalling, so we shouldn't consider this solution.
- Huawei asks if the broadcast information is sent in the clear without security. This may be a problem if the eNB don't want to broadcast location information. Ericsson thinks that only authorized devices can acquire this signalling. Huawei not sure how this would work.

=> Noted

[R2-162926](#) Reporting mechanism of geo-Information for PC5 V2V LG Electronics Inc. discussion

- Panasonic wonders if the UE would also report the information for mode 2. LG considers both modes and in RRC connected the UE is configured with dedicated signalling. Panasonic thinks that for mode 2 the UE doesn't have to report and can do the mapping on its own. LG thinks that when the UE moves to a new area the network would still have provide resources.
- LG wonders how the UE receives the mode 2 pools in RRC connected. Panasonic thinks that it can either provide the pools by dedicated signalling or it can signal the UE to use the pools broadcasted.
- Coolpad wonders if the eNB configures something related to speed scaling. LG thinks network can provide scaling factor. Ericsson asks if it related to event triggered. LG thinks it can be for periodic.

=> Noted

[R2-162340](#) V2V Geo Information Resource Mapping Panasonic discussion

- Huawei is not sure how this is implemented, e.g. how does the UE know in which road it is on. Panasonic explains that based on the navigation device the UE knows where it is. Huawei and Ericsson is concerned for the case where there is no navigation device. Panasonic thinks that there should be a requirement. Ericsson understands that the UE is required to have GPS. Panasonic thinks that UE should have both GPS and map information available. Huawei doesn't understand how we will specify in the AS.
- Qualcomm clarifies that it can be up to eNB how to decide the zones (e.g. doesn't have to use maps). And the UE based on information it has coordinates and maps can determine in which zone it.
- Qualcomm has another solution in which a function is defined in both eNB and UE. Based on this function both UE and eNB would calculate the same zone function.
- LG thinks that theoretically it would be very nice if the eNB has all these information but it may not be feasible for the eNB.
- Panasonic explains that there are zone defined by the eNB and for each zone there is a set of resources.

=> Noted

[R2-162731](#) RAN2 aspects of V2V Qualcomm Incorporated other Rel-14 LTE\_SL\_V2V-Core

=> Noted

## Discussions

### *How reporting is done (L1/RRC/MAC)*

- Qualcomm and Interdigital think that if reporting is done on a second basis then layer 1 reporting is an overkill. Ericsson considers that there are overhead with MAC/RRC, for example SR, BSR, etc. Huawei also doesn't see the motivation.
- Oppo thinks that with higher layer signalling we can extend the information. Ericsson is fine with higher layer signalling but we shouldn't use location information RRC message as a starting point
- 

### *Periodical reporting and event triggered*

- Ericsson wants to allow one shot reporting. Intel thinks that this is already supported, you can configure a periodic reporting with value set to one which corresponds to one shot reporting. Oppo wonders what is the use case. Ericsson thinks that this is a similar concept to CQI, eNB should be able to trigger it if it is not received or if periodicity is low.

### *For mode 2*

#### *Do we need to report geo location information for mode 2*

#### *What information is provided for each resource pool*

1. *the UE encodes its position with respect to a reference position advertised by the eNB*
2. *Concept of zones*
  - *the concept of zone can be used to minimize uplink reporting*
  - LG thinks that this for mode 2. InterDigital and Ericsson thinks that they can be used for both and it would important to minimize uplink reporting

#### *Do we introduce AS geographical location*

- Huawei wonders if the AS solution is really needed. Qualcomm explain that eNB doesn't have access to the application layer reporting.
- Panasonic would like to clarify that this is only for mode 1. It shouldn't be linked to mode 2. Huawei, QC think that the network can configure the UE to report in any mode 2. Oppo thinks that even for mode 2 it can be beneficial to report this information.
- Intel and LG is not sure we need a new report and we can use the UElocationreporting.

#### *On the use of reporting mechanism*

- Intel thinks that no further enhancements on UElocationreporting are needed as the UE can use the existing signalling. LG thinks that MAC CE is better.
- Huawei thinks that there may be times in which the UE has to reports the exact GPS coordinates and generally other times only reports the zones. Ericsson would prefer RRC over MAC CE as it would imply specification complexity.
- Qualcomm indicates that in some countries there are some security requirements that no one entity is allowed to track you so may be SA3 needs to be notified. Panasonic thinks that if it is not allowed in a country the eNB doesn't have to configure this. Intel asks if there are some user authorization.

#### *Whether the zone concept is also used for out-of-coverage*

- Panasonic asks how it is possible to pre-configure resources for out-of-coverage for the whole earth. Qualcomm thinks that we can pre-configure UE to change every 100m. Huawei doesn't see why we should preclude it. LG would like to see the same mechanisms for OOC. Intel thinks we should first see how it can be applied to ooc and then decide. Panasonic and ZTE think that existing solutions from Rel-12 are sufficient. QC indicates that even if we use the full 10MHz we still have problems.

#### **Agreements:**

- Geographical location reporting at AS layer will be introduced. Layer 1 reporting mechanism is not needed. FFS if RRC signalling and/or MAC CE is used. Details of what is contained in the location reporting is FFS.
- It is up to the eNB implementation when and how to use the geo-location. The eNB can configure the UE to report.

- Mode 2 operation should be designed to work without the need for UE dedicated reporting.
- eNB provides configuration for reporting. RAN2 will consider both periodical reporting, event trigger and one-shot reporting. FFS how this is implemented.
- Mapping of geographical location and resources can be done on a zone concept. How the zones are defined is FFS. FFS if this mapping can be used for UL geo reporting to optimize the signalling (if needed).
- FFS if the same mechanism is adopted for OOC or no such optimizations are applied for OOC.

[R2-163006](#) Draft LS to RAN1 on RAN2 agreements related to V2V (Panasonic)

- Ericsson wonders what we expect RAN1 to do with this information. QC thinks at least they can use it to not study L1 mechanisms.
- => The LS is agreed in [R2-163008](#)

Not treated

[R2-162399](#) Geo based resource allocation ZTE Corporation discussion

[R2-162224](#) Geo Information in AS Layer CATT discussion

[R2-162353](#) Discussion on UE Location Reporting for PC5-based V2V Shenzhen Coolpad Technologies discussion

[R2-162456](#) Location based SL resource allocation Intel Corporation discussion

**QoS aspects**

[R2-162284](#) QoS requirements for V2X services Huawei, HiSilicon discussion

- Ericsson agrees with Huawei and that QoS framework for V2V is needed to meet SA requirement
- Nokia Net wonders if the improvements are addressing both V2V and V2X. Huawei thinks that we should have a similar mechanism.
- LG indicates that SA2 will be discussing this. Huawei thinks that we should at least provide some information to SA2 that PPPP as is cannot meet requirements in RAN2. Intel, ZTE and QC thinks that SA2 needs to discuss this. ZTE clarifies that some parameters have to be provided by SA2. Ericsson and Panasonic think that we should involve SA2.

LS to SA2 – on QoS requirements

- Intel thinks that we should ask if PPPP is sufficient to meet the requirement. LG and Intel doesn't think RAN2 should make this decision. LG thinks that we can say that some companies don't think that PPPP is sufficient. Ericsson and Huawei thinks that this is quite obvious that PPPP is not sufficient from latency, reliability, etc.
- => We will indicate to SA2 that some companies have concerns on existing mechanisms (e.g. PPPP for PC5) mechanism to meet QoS SA1 requirements for V2X (PC5 and Uu) and the concerns (briefly). Ask SA2 to study the QoS requirements and notify RAN2 what aspects to address or take into account (if necessary).

[R2-163007](#) Draft LS to SA2 on QoS requirements for V2X (Huawei)  
[CB]

Not treated

[R2-162817](#) QoS enhancements for sidelink and Uu Ericsson discussion  
Moved from 8.11.3

[R2-162285](#) Draft LS on V2X QoS support Huawei, HiSilicon LS out

[R2-162286](#) Support of QoS for PC5-based V2V transport Huawei, HiSilicon discussion

**SPS**

*To be treated with the V2X papers on observations*

Not treated

[R2-162197](#) Discussion on SPS Enhancements for V2V Guangdong OPPO Mobile Telecom. Discussion

[R2-162454](#) SL resource allocation in SPS manner Intel Corporation discussion

[R2-162927](#) SL SPS enhancement for V2V LG Electronics Inc. discussion

[R2-162818](#) Sidelink Resource Allocation in V2X Ericsson discussion

[R2-162486](#) Discussions on Sensing Mechanism for V2V Mode 2 Resource Allocation ITRI discussion

[R2-162831](#) Discussion on Sensing with Semi-Persistent Transmission for V2V Interdigital Asia LLC discussion

**Withdrawn:**

[R2-162131](#) LS on Geo Information Resource Mapping ([R1-161312](#); contact: Qualcomm) RAN1 LS in to: RAN2 Rel-14 LTE\_SL\_V2V-Core withdrawn due to duplication of [R2-162105](#)

## 8.2.2 Other

*Other aspects related to V2V*

[R2-162923](#) Resource allocation enhancement for V2V LG Electronics Inc. discussion

=> Not treated

[R2-162196](#) Discussion on Basic Procedure for V2V Guangdong OPPO Mobile Telecom. Discussion

=> Not treated

### PC5 and Uu path switch

[R2-162289](#) Configuration of PC5 and/or Uu for V2V transport Huawei, HiSilicon discussion

- LG thinks that we should have a mechanism to control and spread the number of UEs in PC5 and Uu.
- LG thinks that we should identify use cases and have an analysis for different use cases (for example capacity use case, failure case, QoS, and co-existence issue).
- Ericsson also thinks QoS can be considered in the path selection
- Qualcomm thinks that this can already be done and is not sure why we would have both configured at the same time.
- Huawei understands that in Rel-12 both Uu and PC5 can be configured at the same time.
- LG clarifies that the UE shouldn't transmit messages on both interfaces. We should specify tx side. From the UE perspective it should receive on both PC5 and Uu to ensure that it receives all messages.

=> Transmissions to both PC5 and Uu of the same message is excluded

=> If there is a path switching mechanisms we should target a simple solution

=> Noted.

[R2-162401](#) Discussion on the V2V path selection between Uu and PC5 ZTE Corporation discussion

=> Not treated

[R2-162946](#) Path switching and channel aspects for V2V LG Electronics Inc. discussion

=> Not treated

#### ☒ [LTE/V2V] Tx PC5 and Uu path switch for V2V – Huawei

- Identify need/use cases and whether there is something that has to be done
- Identify key aspects to address and gather companies views/solutions on these aspects and main benefits of the solutions. Solutions should be limited to the ones proposed in papers in this meeting.
- **Deadline:** 6<sup>th</sup> of May for company inputs and May 9 circulate conclusions of the email discussion
- **Outcome:** Capture conclusions/proposal for RAN2#94

### Layer 2 protocol stack

[R2-162810](#) Layer- 2 Protocol Stack for PC5-based V2X Ericsson discussion

=> Not treated

### Multicarrier

[R2-162811](#) Discussion on PC5 multiple carrier Ericsson discussion

=> Not treated

### Mobility

[R2-162455](#) Support of robust resource allocation to temporal mobility interruption Intel Corporation discussion

Moved from 8.2.1

- Panasonic wonders if the receptions pool today are given for neighbour cells as well. Intel clarifies that the timing is with respect to the source cell. Qualcomm understand that there is no associated cell id for the pools broadcasted by source cells.
- Panasonic thinks that the time to synchronize to the target cell is not very large.
- LG understands GNSS synchronization is supported as well.

- Panasonic and Qualcomm considers that there are different combinations cases: 1) the same pool is used in both source and target 2) in some cases there would be a delta 3) a full new set has to be provided
  - Panasonic wonders how big these pools would be and it is very important that the HO command should be as small as possible. Panasonic thinks that this can be handled by the network and the network can schedule rx pools with higher periodicity.
  - LG asks if zone based pools will be supported. Qualcomm thinks that zones were associated with transmission and we are talking reception.
  - LG thinks that this also happens in cell reselection cases.
  - Ericsson also thinks that there is an interruption time associated with when the UE starts using the Tx resources in the HO command. Intel understands that the UE doesn't have to wait until the handover is completed.
  - Ericsson wonders if interruption time for cell reselection should be improved. One obvious solution to put the UE in connected mode. Panasonic thinks that for cell reselection the UE can acquire the SIB from target cell before reselection (there is no strict criteria).
  - Oppo indicates that we agreed for V2X not to optimize idle mode and we should apply the same agreement for V2V. Intel and QC thinks that conclusion was made for Uu and for latency.
- => Agree that there is an interruption time due to the UE acquiring reception pools in the target cell in handover. FFS is there is a critical issue for cell reselection case and whether solutions optimizing cell reselection are necessary.
- => RAN2 will study mechanisms to limit the PC5 interruption time due to handover
- => The UE should be allowed to start using the Tx pools before the HO is complete as long as synchronization is performed with the target cell.
- => Noted

☒ **[LTE/V2V] Mobility for V2V – Intel**

- Capture the solutions proposed to limit Rx (mode 1 and 2) and Tx mode 1 PC5 interruption time for handover case and pros/cons of each solution. Solutions are limited to the ones proposed in documents submitted to RAN2#93bis.
- Discuss whether cell reselection needs to be optimized. No solutions to be discussed at this stage.
- Discuss what happens in RLF/HO failure case (mode 1 and mode 2).
- **Deadline** May 6<sup>th</sup> to gather all company inputs. May 9<sup>th</sup> circulate conclusions.

[R2-162290](#) Sidelink resource configuration during handover Huawei, HiSilicon discussion  
=> Not treated

[R2-162406](#) Study on High Mobility Scenario in V2X ZTE Corporation discussion  
Moved from 8.11.3  
=> Not treated

☒ **[LTE/V2V] Running 36.300 – LG**

- capture agreements from RAN2#93bis
- Outcome: endorsed running 36.300
- Deadline: one week after the meeting

## 8.4 SI: Further Enhancements to LTE Device to Device, UE to Network Relays for IoT and Wearables

(FS\_feD2D\_IoT\_relay\_wearable; leading WG: RAN2; REL-14; started: Mar. 16; target: Jun. 16; SID: [RP-160677](#))

Contributions should focus on evaluating scenarios in RAN2 considering progress in SA WGs. As a result of the identified scenarios and potential impacts/complexity analysis of supporting those scenarios, refine objectives of the SI accordingly.

Documents in this agenda item handled in the LTE Break Out session

[R2-162529](#) On Scenarios and Objectives for Wearables and FeD2D Ericsson discussion

*Proposal 3 A potential future work or study item should include a coverage scenario where the rUE is in eNB coverage and the wUE is in extended coverage.*

- Intel wonders if the intention is to also study the case where both relay and remote UE are in coverage. Ericsson thinks we can include. Intel sees a benefit in terms of power saving, Huawei has a similar view as Intel. Panasonic agrees and the devices should be in proximity. Apple thinks that we should not limit to proximity only and we should broaden the range. Qualcomm agrees.

*Proposal 4 A potential future work or study item should not include a coverage scenario where the rUE and wUE both are in extended coverage.*

- Huawei would like to understand what is the technical impact of these proposals, for example what the implications of NB-IoT are.

*Proposal 6 A potential future work or study item should develop and study relevant traffic models which accurately reflect current and future market needs.*

- Huawei wonders if the intention is to allow R10 relay to be in scope. Ericsson thinks that it is one way of doing but given that the relay UE would be a smart phone then it may not work. Huawei thinks that it is not in scope at all and is not part of the use cases.

=> The relay UE is connected to the eNB via the Uu interface as a scoping assumption of the study item

=> Noted

[R2-162741](#) Scenarios for FeD2D Qualcomm Incorporated other

- Sequans would like to understand if there was any assumption on the overhead. Qualcomm indicates that there are different ways to transfer the data over the relay and they assumed one way of doing it.
- Huawei wonders what the SA2 involvement needs to be for the service continuity and QoS. Qualcomm thinks that they need to be involved, either by a SI or an LS. Qualcomm thinks that SA1 SI can be a trigger point for SA2.

*Interface used devices (relay and wearables)*

- *Study UE to network relaying over non-3GPP (BT/WiFi) access and sidelink access*
  - Ericsson BT is out of scope of SA1 SI. Apple thinks BT is important and the most used technology.
  - Huawei agrees that from a market perspective BT should be included, but SA1 didn't include. However we can still have a technology agnostic architecture discussion. Qualcomm agrees and we will not be doing anything specific related to BT or WiFi. To RAN2 they are like a black box.
  - Panasonic wonders if we would have to understand how BT and WiFi work.
  - Ericsson doesn't feel we should make such agreements that we would have a generic relay architecture, especially if SA1 has different proposals. Huawei thinks that SA1 will have similar requirements and it is unlikely that SA1 will have diverging requirements.
- => Study relay architecture solutions over both Non-3GPP and 3GPP as per SA1 guidance. RAN2 should strive to develop a common architecture if possible (based on SA1 requirements). We will treat BT and WiFi the same in this framework.
- => RAN2 will not study any specific enhancements to BT or WiFi but can study any possible sidelink enhancements if necessary.

*Discussions on type of wearable (power efficient or high-bitrate)*

- Ericsson thinks that power efficient wearables should be prioritized. Huawei doesn't disagree but wonders what are the implications in terms of the study items. Ericsson doesn't want to work on improving the SL interface for these use cases.
- Intel agrees power efficient is important but at the same time we can support high bit rate.
- LG also wants to prioritize the power efficiency, but think we should talk about services (e.g. which services should be prioritized). Apple agrees with LG.
- Qualcomm also thinks that power efficiency is the primary target but if it includes the bit-rate that is not excluded.

- => The primary objective should be to address power efficiency for the wearable device (this is applicable to all UE categories). Bit rate improvements are not excluded.

*Discussion on MTC/NB-IoT UE*

- Panasonic wonders what aspects we are address, UE complexity or coverage enhancements. Ericsson thinks that improve power and coverage we can start with the low cost devices.
  - Ericsson thinks that we should start the wearable is Cat-0, Cat-M1, or NB-IoT UE
  - Huawei wants to understand whether the intention is to use such categories over the Uu or to enhance the interface of these categories between the wearable and the relay.
  - Apple thinks we should consider Cat-0, Cat-M1, or NB-IoT, but we should not limit to this and there are other categories that would have a higher priority. Qualcomm thinks that we need to adapt sidelink for these categories.
  - Panasonic thinks for power efficiency we shouldn't use MTC/NB-IoT categories.
  - Panasonic thinks that if we study D2D for NB-IoT we would have to design a new PHY layer. Qualcomm thinks that this is true. Oppo thinks that this should be in scope. Sequans indicates that this would require a large number of TUs in RAN1. Ericsson would like to avoid large impacts. TIM thinks that we should have some requirements as to why we would design new PHY. Panasonic doesn't understand the motivation for this, NB-IoT was designed for low cost. Sequans thinks that for unidirectional there will be battery savings.
  - LG and Qualcomm thinks that doing D2D with 6PRB limitation of MTC is possible and is beneficial.
  - LG thinks that we shouldn't study NB-IoT within this release.
  - Panasonic and LG would like to ensure that there will be no repetition on PC5.
- => RAN2 will not limit the scope of the SI to a certain UE category as a starting point (i.e. any UE category can be considered and dependent on SA1)
- => For now we consider to study how sidelink communication can be done with eMTC BW limitation
- => FFS if we will include NB-IoT UEs based on RAN1 TUs, use cases, and impacts

*Discussion on coverage scenario*

1. Remote and relay UE are in coverage
2. Remote UE is in extended coverage and relay UE in coverage
3. Relay and remote UE are in extended coverage
4. remote UE out-of-coverage

- only if SA1 includes it in scope
- Apple thinks that 1 and 2 should be considered
- Ericsson thinks that the first three can be studied but not the 4<sup>th</sup> one
- ITL thinks that this is for commercial but would like to understand whether the enhancements can be used for public safety. ZTE thinks that only the commercial case should be covered.
- ZTE wonders what extended coverage means.
- Huawei doesn't think that the 3<sup>rd</sup> case makes much sense and it is not clear whether the relay UE would have MTC capability. Ericsson agrees that from a service perspective it would be difficult for the relay UE to do this but battery consumption for the remote UE would be improved. Apple wonders what the impacts would be on the work if the relay UE is in extended coverage.
- Nokia Net agrees that the first two are more important. Without strict requirements from SA1 we should not study 4 coverage scenario.
- Sequans wonders if an additional scenario should be considered where the UE is barred from accessing the cell. Huawei considers this as a valid issue but is not linked to a coverage scenario. We should discuss this in the SI phase what the UE should do when barred.
- Panasonic considers that the remote UE doesn't have to be in RRC connected state.
- Ericsson thinks that PS OOC should be left to SA1. Panasonic thinks that we should not discuss out-of-coverage again as we already designed it well in Rel-13
- Qualcomm thinks that we should develop the work from a commercial point of view and nothing can prohibit PS. Huawei doesn't think that we can prohibit the UEs from implementing anything we specify. TIM thinks that his discussion is more of a WI phase discussion.

- => The study item will study the following coverage scenarios: 1) remote UE and relay UE are in-coverage 2) relay UE has a Uu connection to the eNB and remote UE can be in extended coverage (extended coverage implies that the UE is connecting to the network via Rel-13 MTC or NB-IoT in CE mode)
- => RAN2 assumes that out-of-coverage remote UE and PS specific requirements will not be included in the initial Study Item scope. SA1 can continue discussions as per their SI scope and if they include out-of-coverage or PS specific requirements RAN2 can discuss their inclusion and prioritization at a later stage.

*Discussion on how to route the CP and UP*

- *CP and UP*
- *Unidirectional and bidirectional*
- Ericsson thinks that we should study all and not prioritize. Huawei has concerns on the complexity of the unidirectional scenario and would like to see some technical analysis and impacts in the may meeting. Samsung also would like to see the benefits. Sequans thinks that there will be impacts to both unidirectional and bi-directional.
- Nokia Net indicates that bi-directional is a good starting point and unidirectional is an enhancements. LG agrees.
- => RAN2 will study all the routing scenarios and prioritize as part of the SI phase after understanding impact and gains.

*Service continuity*

- *Between PC5 and Uu*
- *Between Uu and non-3GPP*
- *Between SL and non-3GPP access*
- Apple would like to understand if the service continuity would also apply to from non-3GPP to sidelink. Qualcomm explains that the main purpose was between PC5 and Uu. Intel wonders what is the use case for moving between non-3GPP and 3GPP.
- Ericsson thinks that the SA1 SID addresses service continuity so they should discuss and provide us with a service requirements.
- Nokia Net would like to see some downscoping in the SI phase. Huawei thinks that we should try to understand the intention from SA1.
- Ericsson thinks that we shouldn't use the term UE-to-NW relay terminology. Qualcomm and Intel think that layer 2 relay is the most appropriate. Panasonic wonders why we should refer to it as relay.
- => Based on SA1 service requirement and in collaboration with SA2, study service continuity between new relay [CB on terminology] (PC5 or non-3GPP) and QoS aspects

*Input to RAN plenary*

- Qualcomm indicates that after discussing with the RAN secretary there is no TR so we can consider writing and LS to the plenary indicating RAN2 conclusion. LG thinks that we can also have a status report.
- Ericsson thinks that we should also discuss the structure of the SI and whether we have a WI and an SI or just an SI and how to structure it.
- => For next meeting rapporteur can update the SI with the current conclusions and a draft LS with RAN2 conclusions up to RAN2#93bis

[R2-162152](#) on future D2D: scenarios and considerations Sequans Communications discussion

=> revised in [R2-162972](#)

[R2-162972](#) on future D2D: scenarios and considerations Sequans Communications discussion

- Sequans would like to capture the intention that the relay UE is a smart phone. Apple doesn't see why we have to say smart phone.
- InterDigital thinks we shouldn't exclude UE categories similar to the remote UE agreement.
- => Noted

Not treated

[R2-162695](#) feD2D scope of work clarification Nokia, Alcatel-Lucent Shanghai Bell discussion

[R2-162402](#) Considerations on the working scope of R14 feD2D ZTE Corporation discussion

[R2-162641](#) General technical consideration on PC5 enhancement for UE-To-NW relay Huawei, HiSilicon discussion

- [R2-162643](#) Commercial scenario & use case for FeD2D Huawei, HiSilicon discussion  
[R2-162636](#) Scope and phasing of D2D Relay enhancements Sony discussion  
[R2-162195](#) Discussion on Scenarios and Scope for FeD2D Guangdong OPPO Mobile Telecom.  
discussion  
[R2-162240](#) Consideration on the Enhancement of UE-to-Network Relay Fujitsu discussion  
[R2-162354](#) Discussion on UE-to-NW relay architecture enhancements Shenzhen Coolpad Technologies  
discussion  
[R2-162516](#) Discussions on Public Safety for FeD2D Innovative Technology Lab Co. discussion  
[R2-162642](#) L2 UE Relay technology consideration for wearable Huawei, HiSilicon discussion  
[R2-162714](#) Initial considerations of ProSe Relay operation for wearable devices Kyocera discussion  
[R2-162720](#) Discussion on FeD2D scenarios Intel Corporation discussion  
[R2-162922](#) Scenarios and Scope of FeD2D LG Electronics Inc. discussion

## 8.8 WI: L2 latency reduction techniques for LTE

(LTE\_LATRED\_L2-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Sep. 16; WID: [RP-160667](#))

Time budget 1TU

Documents in this agenda item handled in the LTE Break Out session

### 8.8.1 Short SPS

Short SPS period to allow UL prescheduling

[R2-162237](#) Short SPS period for UL prescheduling Samsung Electronics Co., Ltd discussion

*Proposal 1: Introducing  $sf1$ ,  $sf2$ ,  $sf3$  and  $sf4$  as new uplink SPS periodicity.*

*Proposal 2: Using the spare values in `semiPersistSchedIntervalUL` for new uplink intervals.*

- Intel thinks that we should only add efficient values and we should also look at TDD before we decide value
  - Chair thinks that we can discuss the values in the next meeting, but we should consider having a small set to fit in the existing IE.
  - ZTE indicates that in the SI we already agreed to introduce 1ms.
- => Discuss what values other than 1 should be introduced in the next meeting  
=> Noted

[R2-162423](#) Impact on DRX with pre-scheduling and short SPS periodicity Nokia, Alcatel-Lucent Shanghai Bell discussion

*Proposal 2: The UE performs UL transmission on the SPS occasion when it has UL data to be sent and starts inactivity timer if enabled via RRC.*

- Ericsson wonders if this is a new configuration. Nokia Net confirms.
  - QC wonders how the eNB knows the traffic pattern.
  - Intel understands that when we have a 1ms SPS the UE can never go to DRX. Nokia Net and QC has a different understanding. DRX is for PDCCH and can work independently.
  - Samsung thinks that there are tradeoff between battery consumption and DRX and we shouldn't worry too much about DRX. Nokia Net thinks that battery consumption is in the scope of the work item and we have shown that power consumption is worst when you turn DRX off. Samsung and CATT acknowledge it is in the scope but it was more in the context of padding.
  - Huawei also doesn't want to optimize too much, when the network configures the UE with this short SPS then DRX should also be short. Nokia Net has a different understand of the use case. Huawei doesn't see why there is a short SPS for UL and long DRX in DL.
  - CATT thinks that we should consider DRX optimization for short SPS combined with skipping.
- => Noted

[R2-162262](#) Collision of new transmission and retransmission in short SPS period Huawei, HiSilicon discussion

=> Noted

*Discussion solutions:*

1. *Non-adaptive retransmission is totally replaced by adaptive retransmission*
2. *Prioritize non-adaptive retransmission over new transmission on SPS resources*

- Samsung thinks that we can do nothing, if we design things properly. Nokia Net agrees. Ericsson and Intel thinks that we have to clarify UE behaviour so do nothing doesn't apply.
  - Huawei thinks that we should be allowed to retransmit on the SPS. Nokia Net thinks that the eNB can fix this by giving an adaptive grant. Sequans asks how it is possible for the eNB to know whether this is a new transmission or retransmission. Nokia Net thinks that the eNB can do DTX/PUSCH detection. CATT has the same concern as Sequans, new tx and retx have different RV versions. Huawei doesn't think the eNB can know.
  - Ericsson and Intel thinks that for short periodicity there is benefit to allow the UE to use the SPS occasions for non-adaptive retransmission. Huawei thinks that there would be a large overhead if we have to always do adaptive retransmissions.
  - Nokia Net thinks that this is complicated to change.
- => Noted

[R2-162263](#) Short SPS period in TDD Huawei, HiSilicon discussion

- Intel acknowledges that we need to take care of the TDD problem especially the rounding to lowest 10ms integer.
  - CATT thinks solution 2 is the best.
  - Ericsson is looking at the solutions and needs more time to consider all errors.
- => Noted

[R2-162415](#) Remaining issues related to UL SPS China Mobile Com. Corporation discussion

[R2-162466](#) Further aspects of short SPS interval Intel Corporation discussion

*Discuss pain vs. gain of a UL grant indication mechanism using low overhead control channel when UL skipping is enabled*

- Huawei thinks that this is a RAN1 issue and depends on whether the eNB can reliably detect DTX. Sequans explains that as part of their analysis RAN2 cannot assume that there is no problem with detection. We can also keep some legacy behaviour in some cases to avoid some problems.
  - Samsung thinks that this solution should be out of scope as we don't have RAN1 units.
  - Ericsson thinks that in most cases the eNB can detect this and in the error cases that occur very rarely the eNB can handle it. Nokia Net thinks that the detection error will be quite low and if we have activation/deactivation feedback then we don't have much of a problem. ZTE thinks it is too early to decide.
  - Intel thinks that one difference compared with legacy is that the eNB can learn that UE is not using the resource.
- => We will not consider RAN1 specific solutions. If companies agree that there is an error case with the DTX detection probability we can consider RAN2 based solutions.

Not treated

[R2-162768](#) Introduction of short SPS intervals for UL prescheduling Ericsson discussion

[R2-162779](#) Introduction of short SPS intervals Ericsson draftCR 36.331 13.1.0- - B Rel-14  
LTE\_LATRED\_L2

**Agreements**

- FFS what SPS periodicity values other than 1ms should be introduced
- For retransmission colliding with SPS resources we will not only rely on adaptive retransmissions. FFS if the UE can retransmit on the SPS resources if no new data is available.
- For TDD, if SPS configuration is below 10ms the existing text in the spec "the UE shall round this parameter down to the nearest integer (of 10 sub-frames)" doesn't apply.
- 

## 8.8.2 Skipping of UL grants

Skipping of UL grants (e.g. no in case of dynamic and SPS based UL pre-scheduling. Discuss need for feedback for SPS activation, reactivation and deactivation command.

- [R2-162235](#) Issues on Prescheduling and skipping uplink transmission Samsung Electronics Co., Ltd discussion
- Sequans wonders if muting would be applied to every configured resource.
  - Intel thinks that if we have short SPS we should have UL grant skipping.
  - Qualcomm wonders what the difference is between the skipping grant for dynamic or SPS and what enhancements are considered.
  - Ericsson would like to have the freedom to configure UE behaviour, but if we have a long SPS it may not be need.
  - Ericsson, Huawei and Nokia Net also supports separate configuration of skipping for SPS and dynamic grant.
- => It is assumed that the UE behaviour of muting for SPS or dynamic grants will be the same.  
=> Separate configuration of skipping for SPS and dynamic grant will be introduced.  
=> Noted

#### SPS acknowledgement

- [R2-162236](#) Discussion on acknowledging SPS command Samsung Electronics Co., Ltd discussion
- ZTE thinks that the most effective way is to have a HARQ feedback similar to DL SPS. Nokia Net thinks that the DL is quite different.
  - Nokia Net wonders why you have to trigger SR for MAC CE case. The UE can transmit first before releasing the grant on the SPS resource.
- => Noted

- [R2-162504](#) Skipping empty BSR and feedback for SPS activation/deactivation Nokia, Alcatel-Lucent Shanghai Bell discussion
- Qualcomm wonders what is the purposes of the MAC CE
- => Noted

- [R2-162781](#) Acknowledgements for SPS commands Ericsson discussion
- Nokia Net wonders what happens when the UE has data in the buffer when the release is received. Ericsson indicates that the UE can send padding in the next occasion. Nokia Net wonders if the UE has to send an SR.
  - Ericsson thinks that we would have to discuss when we send it.
- => Noted

#### *Discussion on need of activation feedback*

- Qualcomm, CATT see the need for feedback. Sequans sees the need as if the UE misses the resources are wasted.
- Huawei indicates that the problem is not severe as if the UE misses the order the UE can trigger the SR also the probability of missing the command is quite low. ZTE supports. Nokia Net that SR will just introduce more delay and the SR periodicity may be long. Ericsson agrees.
- Nokia Net thinks that if it can happen the eNB has to use conservative PDCCH aggregation level. .
- Intel clarifies that this shouldn't be for sharing resources.
- Qualcomm thinks that we should keep in mind why we did this work, to improve latency and it is important to have feedback fast and reliably.
- Samsung thinks that the probability is low.

#### *Discussion on SPS deactivation*

- => Feedback for SPS deactivation will be introduced. FFS whether we have feedback for SPS activation.

#### *Solutions*

- *Nothing*
  - *MAC CE first SPS location before you release*
  - *MAC padding in the first SPS location before you release*
  - *MAC CE that triggers SR*
- Sequans considers another solution in which legacy occasions are kept. Ericsson thinks that this solution is more periodic rather than explicit feedback immediately.
  - Huawei doesn't see why we are excluding HARQ feedback. Nokia Net explains.

Not treated

- [R2-162468](#) SPS activation, reactivation and deactivation feedback Intel Corporation discussion
- [R2-162265](#) Implicit SPS release under UL grants skipping Huawei, HiSilicon discussion
- [R2-162266](#) Necessity of feedback for SPS activation and deactivation Huawei, HiSilicon discussion
- [R2-162515](#) Feedback for SPS PDCCH command CATT discussion
- [R2-162572](#) Discussion on the feedback of the SPS activation command ZTE Corporation
- [R2-162901](#) Need for feedback of SPS command LG Electronics Inc. discussion
- [R2-162902](#) SPS feedback transmission LG Electronics Inc. discussion

**Other issues**

- [R2-162909](#) Open issues for skipping UL grants QUALCOMM CDMA Technologies discussion
  - Nokia Net and Ericsson thinks that for the first problem, if MAC doesn't send anything to PHY then it will use PUCCH.
  - Huawei thinks that we should also ask them about DTX detection. Nokia Net thinks this is difficult to answer as it depends on implementation.
  - Nokia Net thinks that for TTI bundling the eNB can handle it by implementation. Samsung thinks that we can handle this in our

=> Common understanding is that we will send the LS at least on the UCI issue to RAN1.

=> Noted

- [R2-162264](#) On UL grants skipping Huawei, HiSilicon discussion
  - => Noted

Discussion on BSR

- Ericsson thinks that we should clarify that we would send BSR with padding and no data.
- Asustek doesn't see the need to send the BSR with buffer status set to zero.
- Huawei thinks we should further consider the issue of implicit release. Nokia Net thinks that it is obvious to just skip the BSR.
- Asustek is concerned that this would require the eNB to configure longer BSR.

Discussion on PHR

- Asustek thinks that we should consider the different triggers and the periodic PHR should be skipped. We should also think about sidelink BSR.
- Samsung thinks that the configuration is up to eNB and we shouldn't do any special handling. Samsung thinks that padding BSR is only included if we create a MAC PDU.

- => RAN2 assumption is that the UE will send the BSR/PHR according to legacy trigger (e.g. we will not specify skipping of BSR/PHR when no data is available in the buffer).
- => Padding BSR should not be transmitted. FFS if anything needs to be specified.

- [R2-162782](#) Skip padding option for UL grants Ericsson discussion
  - Huawei agrees that proposal add infinite value to *implicitReleaseAfter* for skip padding option.
  - Nokia Net thinks that implicit release will not happen anyways depending on the MAC modelling. Qualcomm also doesn't see the need and the MAC will take care of it.
  - Samsung thinks that implicit release is not important.
  - Ericsson thinks that there is a simple way of supporting it by counting the skipped occasions.
  - Huawei would like to keep implicit release and increase the number. Intel thinks it doesn't matter what the value is in the implicit release, it just doesn't work.
  - Huawei thinks that a concern is that if we send BSR we will still count. Nokia Net thinks that if we remove the periodic BSR we will not have a problem.

=> If the UE is configured with SPS and UL skipping, then implicit release is not supported. How this is captured in the specs is FFS

=> Noted

- [R2-162467](#) Further aspects of UL grant skipping Intel Corporation discussion
  - => Not treated

- [R2-162735](#) Considerations on skipping UL padding transmissions Sequans Communications discussion
  - On Proposal 4 the issue of UL PSCH

- Intel and Huawei agrees with the issue. Ericsson thinks we should look into this
  - Qualcomm thinks that there may be a problem as this is related to UL
- => Noted

Not treated

[R2-162690](#) Details of Short SPS procedure for latency reduction ETRI discussion  
[R2-162601](#) Discussion on skipping UL grants ASUSTEK COMPUTER (SHANGHAI) discussion

CRs for information

[R2-162780](#) Skipping padding transmissions Ericsson draftCR 36.321 13.1.0- - B Rel-14  
LTE\_LATRED\_L2  
=> Not treated

### 8.8.3 Other

[R2-162267](#) PUSCH resource waste in case of short SPS period Huawei, HiSilicon discussion  
=> Not treated

## 8.11 SI: Feasibility Study on LTE-based V2X Services

(FS\_LTE\_V2X; leading WG: RAN1; started: June. 15; target: June 16; SID: [RP-151109](#))

Time budget: 2TU

**Documents in this agenda item handled in the LTE Break Out session**

Including output of email discussion [93#39][LTE/V2X SI] – Additional observations – LG

**Incoming LS:**

[R2-162116](#) Reply LS to R1-157821 = [R2-161012](#) on clarification of RSU types (S1-160521; contact: LGE)  
SA1 LS in to: RAN2 Rel-14 V2XLTE  
*moved from 3.2*  
=> Noted

### 8.11.1 UL enhancements

*Understanding of V2X traffic characteristic, UL SPS enhancements, and any other UL enhancements*

**Output of email discussion [93#39][LTE/V2X SI]:**

[R2-162949](#) Email Report of [93#39][LTE/V2X SI] Additional observations LG Electronics Inc. report  
late  
=> Not treated

*To be discussed with V2V to draw conclusions on traffic characteristics*

[R2-162296](#) Discussion on SPS based on V2X traffic characteristics Huawei, HiSilicon discussion  
=> Noted

[R2-162825](#) Possible SPS Enhancements for V2X Interdigital Asia LLC discussion

- Intel wonders if the message size can be different for consecutive transmission or different between applications. LG thinks that it can be different but the importance is the size variation.
  - Nokia Net wonders if we should cover other possible periodicities. Ericsson thinks that there is no fixed periodicities as it depends on different triggering conditions but it is correct to assume that it would be between 100ms and 1s.
  - Panasonic wonders how the UE determines the information to report to the eNB. Interdigital indicates that this information is available at the application layer.
  - Ericsson wonders how the UE knows the periodicity, even the application layer may not that. Huawei thinks that the network can know the periodicity based on observations from previous transmissions. Panasonic sees that proposal 5 in the Huawei paper proposes that the UE reports the periodicity.
  - LG thinks that from 3GPP perspective we can find some regularity in periodicity
- => Noted

[R2-162814](#) Observations on CAM Message Periodicity and Payload Ericsson discussion

- LG wonders what is meaning of the indication, is it a release. Ericsson explains that it is just skipping. Nokia Net doesn't know what the point is of indicating that you are not using it, the eNB can figure that out. Ericsson indicates that UE is indicating this before the SPS occasion. Panasonic thinks that in this case too the UE should know in advance so it is not different than the other approaches.
  - Qualcomm is not clear if there is a gain to use SPS, size and period is unpredictable. If companies decide to have something it should be simple.
  - InterDigital and Oppo thinks that the triggers shouldn't be triggered very often and during this time the behaviour will be periodic.
  - Oppo thinks that an indication that the resource is not used is not very beneficial and more information is needed.
- => Noted

#### *Discussions on observations related to SPS*

- *SPS is beneficial for the transmission of BSM and DENM messages which are periodically generated*
- *CAM message generation can be dynamic in terms of size, periodicity and timing. There may be some regularity in size and periodicity between different triggers. Such changes will result in misalignment between SPS timing and CAM timing, increasing probability of the UE not meeting V2X timing requirements*

#### *SPS periods*

- 100, 200, 1s?
- Ericsson thinks that we should also consider 50ms. Qualcomm wants to ensure that this shouldn't be linked to having the 2c enhancement below.
- Huawei thinks that we should also include 200ms based on their calculation.

#### *Is there a need for SPS enhancements*

- Intel thinks it seems dynamic. Oppo thinks that when the speed is constant the period is constant.

#### *Enhancements*

1. *Dynamic alignment SPS with traffic generation*
2. *eNB configures the SPS*
  - a. *Inform eNB of change of traffic period*
  - b. *Inform eNB of change of timing offset*
  - c. *Inform eNB of not usage of SPS occasion*
  - Ericsson doesn't think that the UE reporting is useful, as the traffic conditions are no longer met after the UE sends this report. Panasonic thinks that the UE assistance is helping the eNB to find out earlier that something has changed.
  - LG also supports that this kind of information should be available in the eNB.
  - Nokia Net thinks that if the UE reports then this is no longer SPS
  - LG wonders if the eNB needs to know for initial SPS configuration. Ericsson, Huawei, Nokia Net don't think so.
3. *Support of multiple parallel SPS configuration*

**=> Companies need to bring text proposals in the next meeting with their papers.**

#### **Agreements:**

- Observation: CAM message generation can be dynamic in terms of size, periodicity and timing. Such changes will result in misalignment between SPS timing and CAM timing. There may be some regularity in size and periodicity between different triggers.
- SPS can be beneficial for some cases and SPS can be configured. FFS if UE assistance is necessary
- At least the following SPS periodicities should be included 100 and 1s can be included.
- FFS if SPS enhancement are necessary

#### Not treated

- [R2-162222](#) Consideration on SPS Enhancement CATT discussion
- [R2-162200](#) Discussion on SPS Enhancements for V2X Guangdong OPPO Mobile Telecom. discussion
- [R2-162816](#) Other Uu Enhancements for V2X Ericsson discussion

- [R2-162238](#) Discussion on UL enhancement for the case with high density UE Fujitsu discussion  
[R2-162296](#) Discussion on SPS based on V2X traffic characteristics Huawei, HiSilicon discussion  
[R2-162398](#) SPS enhancements for V2X over Uu ZTE Corporation discussion  
[R2-162947](#) UL enhancement for V2X LG Electronics France discussion

## 8.11.2 DL enhancements

*Improvements of MBMS/SC-PTM services on the basis of UE geographical location (whether there is a need for a specific AS mechanism or the application layer mechanism is sufficient), MBMSFN latency, and other DL enhancements.*

### Latency

- [R2-162221](#) Discussion on latency enhancement of broadcast V2X services CATT discussion

Moved from 8.11.1

*Enhancements reduction of latency due to large MCCH modification period*

- a). Use of pre configured MRB
- b). Use of shared MRB
- c). Introduction of short MCCH modification period
- d). Introduce a new MRB configuration channel for V2X

- Huawei wonders what the latency problem. Ericsson thinks that there will be latency if changes happen. LG thinks that there is a problem when the UE changes area and it can lose up to 300ms. LG thinks that modification is not sufficient and we need to consider avoiding reading the MCCH channel.
  - LG if we introduce skipping MCCH channel then shorter MCCH modification period may not be needed. ZTE also agrees that MCCH modification period should be shorter.
  - Nokia Net wonders if preconfigured MRB means
- => Noted

- [R2-162815](#) Other MBMS Enhancements for V2X Ericsson discussion

*Proposal 1 Introduce 10ms MCH scheduling period.*

- Huawei thinks that we meeting the latency requirement and this is not needed. Shorter scheduling period may introduce some backward compatibility issues.
- ZTE thinks that shorter MCH scheduling period is necessary. LG supports.
- Qualcomm indicates that this are optimizations are for plain vanilla MBSM and localized MBMS is another optimization.

=> Noted

- [R2-162943](#) DL broadcast enhancement for V2X LG Electronics Inc. discussion

- Nokia Net wonders how the UE acquires some important configuration information if it skips. LG thinks that the UE has to first acquire the information and then monitor the common scheduling information.
- Intel asks if we have the same delays for the overlapping area case. Intel and Ericsson thinks that whenever the UE enters the new cell for overlapping area it doesn't have to reacquire. Ericsson indicates that there can be up to 8 areas.
- ZTE doesn't think that this is not essential for large MBSFN area and this proposal depends on whether RAN3 agrees to use localized MBSFN.
- Ericsson thinks that proposal 1 this has large impacts to standardization
- Ericsson thinks that proposal 2 is already supported.
- ITRI partly supports LGs proposal.
- Ericsson thinks that there is a price to pay for not reading the MCCH for the system
- Huawei is not sure that the control plane latency is critical and it is no problem if some packets are lost. LG indicates that there may be up to 300ms delay and many packets may be missed from multiple sources. Ericsson also doesn't think that this is important and the multiple MBSFN area can address parts of this problem.
- LG thinks that the gains of these optimizations should be studied.
- LG would like to have an email discussion.

=> Noted

- [R2-162397](#) Discussion on the eMBMS based V2X broadcast ZTE Corporation discussion

=> Noted

Agreements:

1. Both MBSFN and SC-PTM can be used
2. For MBSFN and SC-PTM the following optimizations are considered to be added, shorter MCCH and SC-MCCH modification period, shorter repetition period and for

- MBSFN shorter MCCH scheduling period (e.g. 10ms). We will capture these optimizations and capture pros/cons and gains.
3. FFS on the critically of the control plane latency and whether latency requirements can be met with this optimizations will be further analysed.
  4. We will consider can use pre-configured MRB

### Location based aspects

- [R2-162453](#) Location based V2V message forwarding in Uu-based V2V Intel Corporation discussion
- Ericsson wonders if AS information can be useful. Huawei thinks that when the UE is using PC5 we may need the AS information. Intel indicates that anyways the PC5 location information can be configured.
- => RAN2 assumes that the application/upper layer can provide the necessary location information for DL broadcast and AS mechanism is not needed to assist the application server.
- => Noted
- [R2-162405](#) Reporting geo information to eNB Samsung discussion
- => Not treated
- [R2-162292](#) Uu-based V2V Transport Based on Location Information Huawei, HiSilicon discussion
- Ericsson thinks that the network doesn't need to where the UE is. Huawei thinks that we also need to consider unicast.
- => Noted

Not treated

- [R2-162821](#) V2X Message Provisioning for MBMS Ericsson discussion
- [R2-162701](#) The discussion on applicability of geographical information in MBMS for V2X systems  
Nokia, Alcatel-Lucent Shanghai Bell discussion Rel-14  
FS\_LTE\_V2X
- [R2-162700](#) The discussion on operational aspects of MBMS with MBSFN and SC-PTM Nokia, Alcatel-Lucent Shanghai Bell discussion
- [R2-162220](#) Discussion on capacity enhancement of broadcast V2X services CATT discussion
- [R2-162239](#) Discussion on the DL enhancement for Uu-based V2V communication Fujitsu discussion
- [R2-162487](#) Discussion on the MBMS V2V transmission and reception ITRI discussion
- [R2-162824](#) Discussion on The Use of Location Information for V2X Interdigital Asia LLC discussion

Evaluations

Not treated

- [R2-162702](#) Further PRR results for V2X Scenario 2 in Urban case Nokia, Alcatel-Lucent Shanghai Bell discussion
- [R2-162819](#) System level performance using SC-PTM Ericsson discussion
- [R2-162967](#) Evaluation results on location based DL broadcasting for V2V LG Electronics discussion late

### 8.11.3 Other enhancements

*Need for QoS and potential enhancements, need for mobility enhancements, PC5 enhancements not targeting V2V, etc.*

- [R2-162219](#) Considerations on Mobility Enhancements CATT discussion
- => Not treated
- [R2-162199](#) Discussion on Handover Enhancements for V2X Guangdong OPPO Mobile Telecom. Discussion
- => Not treated
- [R2-162291](#) Potential Enhancements for Uu-based V2V Transport Huawei, HiSilicon discussion
- => Not treated

#### V2P/P2V

- [R2-162728](#) V2X Communications Qualcomm Incorporated other
- InterDigital clarifies that SA1 includes both scenarios, so are we excluding one of them. Intel agrees that all three scenarios are included but from RAN2 point of view we will only optimize P2V
- => Between V2P and P2V RAN2 will prioritize study of P2V.

- => V2P/P2V can be done over Uu
- => Scenario 3 is de-prioritized for all the cases.
- => Noted

[R2-162945](#) Other enhancements for V2X LG Electronics Inc. discussion  
V2P

- Qualcomm wonders if this interest indication is needed only in the case we don't have a pool.
  - Chair thinks this a stage 3 discussion.
- => Noted

Not treated

[R2-162488](#) Discussion on PC5 handover and Uu handover for V2X ITRI, National Taiwan University discussion

[R2-162823](#) Discussion on Mobility Enhancements for V2X Interdigital Asia LLC discussion

[R2-162491](#) Some consideration of Resource Allocation in V2X Potevio Company Limited discussion

#### QoS

[R2-162820](#) Traffic Management in V2X Ericsson discussion

[R2-162817](#) QoS enhancements for sidelink and Uu Ericsson discussion  
Moved to V2V

[R2-162812](#) DRAFT LS on V2X Subscriber Information Ericsson LS out  
Moved from 8.2.1

### 8.11.4 Scenarios

New scenarios (simple ones), discussions on V2I/V2N/V2P, and impact of supporting inter-operator deployments

[R2-162822](#) V2X Scenarios Ericsson discussion

- => Scenario 2 is applicable to V2N/V2I/V2P/P2V
  - Oppo doesn't see the need of UL only scenario. LG thinks that we are talking about servers so we should have UL only case
- => Scenario 2 should separately describe the combination DL only and UL only.
- => The study in RAN2 does not considers the case that each operator is allocated with a different uplink carrier while a set of downlink operation carrier(s) is shared by UEs subscribed to different operators.
- Intel thinks that may there is a way for the network to handle and not have a requirement to receive on multiple DL carriers.
- => Inter-PLMN reception for DL broadcast is allowed.
- => The UE may receive on multiple DL carriers.
- Huawei wonders how this is possible without multiple DL carriers and RAN3 concluded that RAN sharing is not always available. Ericsson indicates that this is not only a RAN3 sharing issue. There may be cases and DL broadcast for multiple operators can be transmitted on the same carrier.
- => Noted

#### ☒ [LTE/V2X] – TP capturing RAN2 agreements

- Agree to TP capturing RAN2 agreements
- Deadline May 9<sup>th</sup>

Not treated

[R2-162293](#) Operating Scenarios for the Uu-based V2I/V2N/V2P Huawei, HiSilicon discussion

[R2-162944](#) Further discussion on V2X scenarios LG Electronics Inc. discussion  
*definitions*

[R2-162400](#) Discussion on eNB type RSU and UE type RSU ZTE Corporation discussion

[R2-162223](#) Remaining issues of V2X Scenarios CATT discussion

[R2-162294](#) Discussion on V2I/V2N/V2P transport based on PC5 Huawei, HiSilicon discussion

[R2-162295](#) Consideration on inter-PLMN operation for Scenario 2 Huawei, HiSilicon discussion

- [R2-162396](#) Some considerations on multi-carrier and multi-operator support for V2V scenarios ZTE Corporation discussion
- [R2-162457](#) Scenarios for V2P Intel Corporation discussion

## Agreed outgoing LS

R2-163008 LS RAN2 agreements related to V2VRAN2 LS out to: RAN1 from: RAN2  
Rel-14 LTE\_SL\_V2V-Core

## Comeback on Friday

- [R2-162155](#) Miscellaneous correction for sidelink Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Nokia Net thinks that maybe having a second block of text on *discConfigPS*. Ericsson thinks that this would result in the same action and specs. Qualcomm thinks that the changes are fine and the UE should know to use PS pools.
  - Nokia Net would like to understand why the change in 5.3.3.1a is needed. Qualcomm doesn't think it is needed, the UE is already acting as a relay.
  - Ericsson thinks that if the UE is acting as sidelink relay UE it should already be connected.
  - => In 5.3.3.1a The first check is "if *SystemInformationBlockType19* is broadcast by the cell on which the UE camps and includes *discConfigRelay*" is not needed
  - Huawei thinks for relay operation the UE should move to connected no matter what pool is being broadcasted
  - => 5.3.3.1a Second addition discuss offline [CB]
  - In 5.3.3.1a Nokia Net thinks that we should rename the IE to be specific to discovery interfrequency instead of *discTxPoolCommon*-**r12**; Ericsson thinks that it is addressed in the next paragraph.
  - ZTE thinks that we shouldn't include all information in 5.10.2.1. QC and Ericsson thinks that it should be mentioned as it was an new introduction.
  - => 5.10.2.1 just put "or sidelink discovery gaps"
  - => in section 10.5.4 change and/or to "or"
  - => check if in section 5.10.6 the pool IE name is actually UE-selected or if we should refer to a new IE [CB]
  - Ericsson wonders what we do with all the CRs. It may be good to combine to avoid clashes.
  - => We will do it case by case
  - => The CR is revised in [R2-163002](#)
- [R2-163002](#) Miscellaneous correction for sidelink Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core [CB]
- [R2-162157](#) Corrections for sidelink communication transmission Huawei, HiSilicon, ITRI draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Qualcomm thinks that this is just re-writing the existing agreement. [CB]
- [R2-162217](#) Corrections on description of commTxAllowRelayCommon CATT draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core
- Nokia Net thinks that commTxAllowRelayCommon is only for the relay UE. CATT thinks that the intention is that the remote UE can only use the common pool, not the relay. Ericsson thinks that the IE is for both.
  - => The intention is that the commonTxRelaypool is used for the remote UE only. [CB on how this should be capture if it at all]
  - [=> The CR is postponed]
- [R2-163003](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.331 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core [CB]
- [R2-163009](#) Correction on conditions of sidelink operation Huawei, HiSilicon draftCR 36.304 13.1.0- - F Rel-13 LTE\_eD2D\_Prox-Core

[CB]

[R2-163004](#) Corrections on sidelink related description in TS36.302 CATT draftCR 36.302 13.1.0- -  
F Rel-13 LTE\_eD2D\_Prox-Core  
[CB]

[R2-163007](#) Draft LS to SA2 on QoS requirements for V2X (Huawei)  
[CB]

## E-mail discussion for the meeting

- ☒ **[LTE/V2V] Tx PC5 and Uu path switch for V2V – Huawei**
  - Identify need/use cases and whether there is something that has to be done
  - Identify key aspects to address and gather companies views/solutions on these aspects and main benefits of the solutions. Solutions should be limited to the ones proposed in papers in this meeting.
  - **Deadline:** 6<sup>th</sup> of May for company inputs and May 9 circulate conclusions of the email discussion
  - **Outcome:** Capture conclusions/proposal for RAN2#94
  
- ☒ **[LTE/V2V] Mobility for V2V – Intel**
  - Capture the solutions proposed to limit Rx (mode 1 and 2) and Tx mode 1 PC5 interruption time for handover case and pros/cons of each solution. Solutions are limited to the ones proposed in documents submitted to RAN2#93bis.
  - Discuss whether cell reselection needs to be optimized. No solutions to be discussed at this stage.
  - Discuss what happens in RLF/HO failure case (mode 1 and mode 2).
  - **Deadline** May 6<sup>th</sup> to gather all company inputs. May 9<sup>th</sup> circulate conclusions.
  
- ☒ **[LTE/V2V] Running 36.300 – LG**
  - capture agreements from RAN2#93bis
  - Outcome: endorsed running 36.300
  - Deadline: one week after the meeting
  
- ☒ **[LTE/V2X] – TP capturing RAN2 agreements**
  - Agree to TP capturing RAN2 agreements
  - Deadline May 9<sup>th</sup>

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## Summary of Agreements on Rel-13

### SI on Wearables

- The relay UE is connected to the eNB via the Uu interface as a scoping assumption of the study item
- Study relay architecture solutions over both Non-3GPP and 3GPP as per SA1 guidance. RAN2 should strive to develop a common architecture if possible (based on SA1 requirements). We will treat BT and WiFi the same in this framework.
  - RAN2 will not study any specific enhancements to BT or WiFi but can study any possible sidelink enhancements if necessary.
- The primary objective should be to address power efficiency for the wearable device (this is applicable to all UE categories). Bit rate improvements are not excluded
- RAN2 will not limit the scope of the SI to a certain UE category as a starting point (i.e. any UE category can be considered and dependent on SA1)
- For now we consider to study how sidelink communication can be done with eMTC BW limitation
- FFS if we will include NB-IoT UEs based on RAN1 TUs, use cases, and impacts
- The study item will study the following coverage scenarios:

- 1) remote UE and relay UE are in-coverage
- 2) relay UE has a Uu connection to the eNB and remote UE can be in extended coverage (extended coverage implies that the UE is connecting to the network via Rel-13 MTC or NB-IoT in CE mode)
- RAN2 assumes that out-of-coverage remote UE and PS specific requirements will not be included in the initial Study Item scope. SA1 can continue discussions as per their SI scope and if they include out-of-coverage or PS specific requirements RAN2 can discuss their inclusion and prioritization at a later stage.
- RAN2 will study all the routing scenarios and prioritize as part of the SI phase after understanding impact and gains
- Based on SA1 service requirement and in collaboration with SA2, study service continuity between new relay [CB on terminology] (PC5 or non-3GPP) and QoS aspects

## **V2V WI**

### **Geo-location reporting**

- Geographical location reporting at AS layer will be introduced. Layer 1 reporting mechanism is not needed. FFS if RRC signalling and/or MAC CE is used. Details of what is contained in the location reporting is FFS.
- It is up to the eNB implementation when and how to use the geo-location. The eNB can configure the UE to report.
- Mode 2 operation should be designed to work without the need for UE dedicated reporting.
- eNB provides configuration for reporting. RAN2 will consider both periodical reporting, event trigger and one-shot reporting. FFS how this is implemented.
- Mapping of geographical location and resources can be done on a zone concept. How the zones are defined is FFS. FFS if this mapping can be used for UL geo reporting to optimize the signalling (if needed).
- FFS if the same mechanism is adopted for OOC or no such optimizations are applied for OOC.

### **QoS**

- We will indicate to SA2 that some companies have concerns on existing mechanisms (e.g. PPPP for PC5) mechanism to meet QoS SA1 requirements for V2X (PC5 and Uu) and the concerns (briefly). Ask SA2 to study the QoS requirements and notify RAN2 what aspects to address or take into account (if necessary).

### **Path switch between PC5 and Uu**

- Transmissions to both PC5 and Uu of the same message is excluded
- If there is a path switching mechanisms we should target a simple solution
- Details over email discussion

### **Mobility**

- Agree that there is an interruption time due to the UE acquiring reception pools in the target cell in handover. FFS if there is a critical issue for cell reselection case and whether solutions optimizing cell reselection are necessary.
- RAN2 will study mechanisms to limit the PC5 interruption time due to handover
- The UE should be allowed to start using the Tx pools before the HO is complete as long as synchronization is performed with the target cell.
- Details over email discussion

## **V2X SI**

### **UL enhancements**

- Observation: CAM message generation can be dynamic in terms of size, periodicity and timing. Such changes will result in misalignment between SPS timing and CAM timing. There may be some regularity in size and periodicity between different triggers.
- SPS can be beneficial for some cases and SPS can be configured. FFS if UE assistance is necessary
- At least the following SPS periodicities should be included 100 and 1s can be included.
- FFS if SPS enhancement are necessary

### **DL enhancements**

1. Both MBSFN and SC-PTM can be used

2. For MBSFN and SC-PTM the following optimizations are considered to be added, shorter MCCH and SC-MCCH modification period, shorter repetition period and for MBSFN shorter MCCH scheduling period (e.g. 10ms). We will capture these optimizations and capture pros/cons and gains.
3. FFS on the critically of the control plane latency and whether latency requirements can be met with this optimizations will be further analysed.
4. We will consider can use pre-configured MRB

#### **Location based**

- RAN2 assumes that the application/upper layer can provide the necessary location information for DL broadcast and AS mechanism is not needed to assist the application server.

#### **Scenarios**

- Between V2P and P2V RAN2 will prioritize study of P2V.
- V2P/P2V can be done over Uu
- Scenario 3 is de-prioritized for all the cases.
- Scenario 2 is applicable to V2N/V2I/V2P/P2V
- Scenario 2 should separately describe the combination DL only and UL only.
- The study in RAN2 does not considers the case that each operator is allocated with a different uplink carrier while a set of downlink operation carrier(s) is shared by UEs subscribed to different operators
- Inter-PLMN reception for DL broadcast is allowed.
- The UE may receive on multiple DL carriers

#### **Latency reduction WI agreements**

- FFS what SPS periodicity values other than 1ms should be introduced
- For retransmission colliding with SPS resources we will not only rely on adaptive retransmissions. FFS if the UE can retransmit on the SPS resources if no new data is available.
- For TDD, if SPS configuration is below 10ms the existing text in the spec “the UE shall round this parameter down to the nearest integer (of 10 sub-frames)” doesn't apply.
- We will not consider RAN1 specific solutions. If companies agrees that there is an error case with the DTX detection probability we can considers RAN2 based solutions
- Feedback for SPS deactivation will be introduced. FFS whether we have feedback for SPS activation.
- RAN2 assumption is that the UE will send the BSR/PHR according to legacy trigger (e.g. we will not specify skipping of BSR/PHR when no data is available in the buffer).
- Padding BSR should not be transmitted. FFS if anything needs to be specified.
- If the UE is configured with SPS and UL skipping, then implicit release is not supported. How this is captured in the specs is FFS

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## Annex H:

### LTE Breakout session: eVoLTE, Light conn, Mobility enh

On Wednesday of RAN2 #93bis, in parallel to the main LTE session, an LTE breakout session on eVoLTE, Light conn and Mobility enh. was held in room (Gregale/Zephyros) chaired by RAN2 vice-chairman Hu Nan (CMCC) addressing:

On Wednesday:

8.3LTE: Rel-14: SI: Study on enhancement of VoLTE

8.9LTE: Rel-14: WI: Signalling reduction to enable light connection for LTE

8.6LTE: Rel-14: WI: Further mobility enhancements in LTE

The corresponding report of this session R2-163057 was presented and approved on Fri in the joint session and the contents is provided in this Annex H for convenience reasons.

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### 8.3 SI: Study on enhancement of VoLTE

(FS\_LTE\_eVoLTE; leading WG: RAN2; REL-14; started: Mar. 16; target: Sep. 16; SID: [RP-160563](#))

Time budget 1.5TU

Documents in this agenda item handled in the LTE Break Out session

[R2-162507](#) Work plan of the Study on enhancement of VoLTE China Mobile Com. Corporation discussion *moved from 8.3.4 to 8.3*

- ZTE thinks we should not deprioritise any solution on codec rate change in SID.
  - Moto solution wants to understand why we focus on radio side.
- => Noted

[R2-162608](#) TR Skeleton for study on voice enhancement for LTEChina Mobile Com. Corporation draft TR36.750 0.0.1 Rel-14 FS\_LTE\_eVoLTE *moved from 8.3.4 to 8.3*  
=> Revised in R2-163021.

[R2-163021](#) TR Skeleton for study on voice enhancement for LTEChina Mobile Com. Corporation draft TR36.750 0.0.2 Rel-14 FS\_LTE\_eVoLTE *moved from 8.3.4 to 8.3*  
=> Change the title of section 7 to reflect the radio coverage enhancement.  
=> Check with MCC with the title  
=> Postponed

#### 8.3.1 Codec mode/rate selection/adaptation

[R2-162650](#) Analysis on ECN-triggered codec adaptation solution Huawei, HiSilicon discussion  
=> Noted

[R2-162422](#) Codec selection and adjustment China Mobile Com. Corporation discussion  
=> Noted

[R2-162214](#) Considerations on Vocoder Rate Adaptation Qualcomm Incorporated discussion

- Samsung wants to know the scope of SA2 work on the codec rate selection at call setup.

=> Noted

Discussion:

- Moto solution thinks we should take the end-to-end consideration when developing the RAN-based solution on codec rate adaptation. Samsung thinks we should focus on the RAN side.
- Samsung thinks end-to-end solution is already there. What we should do is to add RAN-based solution into account.
- Moto solution think we should not introduce problem to CN when considering the codec change due to radio condition.
- ZTE thinks the solution should be RAN-assisted not RAN-controlled.
- Nokia Networks and Ericsson have concerns to capture the CAPEX issue.

=> ECN solution needs all the nodes on the path to behave correctly.

- => Capture the current mechanisms of codec adaptation in annex for reference according to R2-162650 and R2-162214.
- => Avoid excessive ping-pong tuning
- => Capture the requirements from the SID objectives part.
- => Confirm that the candidate solutions should be RAN-involved.

[R2-162843](#) Rate adaptation for voice and video communication services Ericsson discussion

P1:

- CMCC wants to the exact meaning of “work together”.
- Ericsson thinks we should not break any existing solutions.

P2:

- Ericsson thinks the codec mode selection and adaptation is out of the scope of RAN.

P3:

- ZTE don't like P3.

P4:

- QC wants to know further motivations. Ericsson give it.

**Agreements:** Capture the following as the principles of the feasible candidate solutions of codec selection/adaptation

1. Any rate adaptation mechanism introduced by RAN can co-exist with the rate-adaptation mechanisms specified in TS 26.114.
2. Any rate adaptation mechanism introduced by RAN should explicitly indicate the recommended bit rate.
3. Avoid excessive ping-pong tuning

FFS: Any rate adaptation mechanism introduced by RAN shall be codec type agnostic

[R2-162647](#) RAN based codec adaptation mechanism Huawei, HiSilicon discussion

=> Not treated

[R2-162560](#) Discussion on the adaptive codec rate change ZTE Corporation discussion

=> Not treated

[R2-162716](#) RAN considerations for codec rate adaptation Kyocera discussion

=> Not treated

[R2-162737](#) Enhanced Codec Control MediaTek Inc. discussion

late

=> Not treated

[R2-162649](#) draft LS to SA4 on RAN based codec adaptation solution Huawei, HiSilicon discussion

late

=> Withdrawn

### 8.3.2 VoLTE/video signalling related enhancements

E.g prioritisation of VoLTE/video related signalling, reduction of call drop probability, etc

[R2-162648](#) Signalling optimization for VoLTE Huawei, HiSilicon discussion

- Ericsson agree the intention but it is a little early to touch detail solutions. OPPO share the same view.

P1:

- ZTE thinks new cause value for VoLTE MT may not needed.

P2:

- Samsung thinks we need to investigate the detailed of the motivation.

P3

=> Encourage companies to show more details about the motivation

=> Noted

### 8.3.3 VoLTE/video quality related enhancements

Enhancements to improve the perceived voice/video quality. This aspect of the WI is expected to be RAN1 led.

[R2-162651](#) VoLTE coverage enhancement solutions Huawei, HiSilicon discussion

- Huawei propose to send LS to RAN1 with potential solutions.

=> Noted

[R2-162408](#) Discussion on coverage enhancement for VoLTE China Telecommunications discussion

=> Not treated

### 8.3.4 Other

[R2-162473](#) Considerations on the scope of the VoLTE enhancements study Intel Corporation discussion  
=> Not treated

☒ **[LTE/eVoLTE] TR skeleton and capturing agreements (CMCC)**

- One week to develop the structure of the TR skeleton
  - Until next meeting capture the agreements from this meeting into the TR
- => Intended outcome: Agreed TR version 0.1.0

☒ **[LTE/eVoLTE] Identify the potential problems from signalling aspect (Huawei)**

- Until next meeting
  - Based on the content of R2-162648 and R2-162473
- => Intended outcome: Discussion report to the next meeting

## 8.9 WI: Signalling reduction to enable light connection for LTE

(LTE\_LIGHT\_CON-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Mar. 17; WID: [RP-160540](#))

Time budget 0.5TU

Documents in this agenda item handled in the LTE Break Out session

### 8.9.1 Paging enhancements

E.g. signaling reduction by limiting the paging area.

Note the WID indicates that only the paging objective is to discussed within Q2 2016

[R2-162275](#) Work plan for light connection Huawei, Intel Corporation, China Telecom discussion  
=> Noted

[R2-162612](#) Considerations on light connection Nokia, Alcatel-Lucent Shanghai Bell discussion  
=> Noted

[R2-162556](#) RAN based paging mechanism Intel Corporation discussion  
- Samsung and Nokia think we should compare the new paging mechanism with the current mechanisms.  
P1  
- China Unicom wants to know the relation between the L-DRX and legacy one.  
=> Noted

[R2-162520](#) General principles and paging optimization in light connection Huawei, China Telecom, HiSilicon discussion  
P1 and 2:  
- Ericsson thins it is the detailed solution.  
=> Work assumption to study the paging enhancement is "S1 connection of a UE lightly connected is kept and active, in order to hide the mobility and state transitions from CN"  
=> Work assumption: Light connected UE can be addressed only by the trigger of paging initiated by eNB or MME.

[R2-162514](#) Discussion on paging in light connectionCATT discussion  
=> Not treated

[R2-162717](#) Initial consideration of paging enhancements for Light Connection Kyocera discussion  
=> Not treated

[R2-162194](#) Discussion on Paging Signaling Reduction for Light Connection Guangdong OPPO Mobile Telecom. Discussion  
=> Not treated

[R2-162727](#) Paging and UP requirements on light connection China Unicom discussion  
=> Not treated

[R2-162276](#) Work assumptions and paging optimization in light connection Huawei, China Telecom, HiSilicon discussion  
late

=> Withdrawn

[R2-162278](#) General aspects for light connection Huawei, China Telecom, HiSilicon discussion

=> Not treated

[R2-162277](#) RAN initiated paging optimization in light connection Huawei, China Telecom, HiSilicon discussion

=> Not treated

## 8.9.2 Other

No contribution received.

## 8.6 WI: Further mobility enhancements in LTE

(LTE\_eMob-Core; leading WG: RAN2; REL-14; started: Mar. 16; target: Dec. 16; WID: [RP-160636](#))

Time budget 1 TU

Documents in this agenda item handled in the LTE Break Out session

[R2-162561](#) Tentative work plan of mobility enhancement ZTE Corporation discussion  
*moved from 8.6.3 to 8.6*

- ZTE point out that so far no TU for RAN1.
  - Nokia wonders how to treat LS in RAN4 in Q2.
- => Noted

### 8.6.1 RACH-less handover

[R2-162532](#) Discussion of solution 1: RACH-less handover Intel Corporation discussion  
=> Noted

✎ **CB on Friday** on the draft LS to ask RAN1, RAN3, RAN4 the feasibility and accuracy of the TA measurement in asynchronised and synchronised network for RACH-less solution and common part of solution 2 family if needed.

- Draft LS is R2-163022
- Provide detailed RACH-less solution as the reference of the LS in R2-163023

Offline discussion before CB should focus on, but not limited:

- Identify the questions for other WGs
- Identify the solution details
- Consider the method proposed in R2-162517 as the baseline to calculate the TA.
- Simultaneously TX/RX issue can be considered to be asked to RAN4

[R2-162517](#) Consideration on RACH-less handover CATT discussion  
- Samsung wonders if the asynchronised scenario is included.  
=> Noted

Just treat the RACH-less part of R2-162910:

[R2-162910](#) Comparison of Mobility Improvements for LTE QUALCOMM CDMA Technologies discussion  
- ZTE thins for inter-frequency scenario the network-based solution is not feasible.  
=> Noted

[R2-162699](#) RACH-less Handover to reduce the length of service interruption Nokia, Alcatel-Lucent Shanghai Bell discussion  
=> Not treated

[R2-162410](#) RACH-less Handover for Mobility Enhancement Huawei, HiSilicon discussion  
=> Not treated

[R2-162409](#) Discussion on solutions to minimize service interruption China Telecommunications discussion  
=> Not treated

### 8.6.2 Make before break handover

[R2-162232](#) Overview of solutions for the LTE mobility enhancements Samsung Electronics Co., Ltd discussion  
- Intel wonders whether there is assumption that the UE has two entire protocol stacks.  
=> Noted

[R2-162411](#) Support of Simultaneous Data Transmission in the Source and Target Sides Huawei, HiSilicon discussion

- Ericsson thinks we should at first identify the detailed the solution before discuss the proposal 1. Samsung share the same view. So far the details are not clear.

=> Noted

[R2-162564](#) User throughput evaluation on mobility events ZTE Corporation discussion

=> revised in [R2-162963](#)

[R2-162963](#) User throughput evaluation on mobility events ZTE Corporation discussion

- Ericsson would like to see more performance on the service interruption rather than the throughput.
- Intel wants to know the complexity of TDM pattern negotiation between eNBs.
- QC thinks the MC after successful RACH is no help for interruption time saving.
- ZTE thinks MC has fewer spec impact than solution 2.

=> Noted

[R2-162719](#) Discussion of solution 2: Maintaining source eNB connection during handover Intel Corporation discussion

=> Noted

☒ **[LTE/Mobility enhancement] Discussion on solution 2 family (ZTE)**

- Deadline: May 12
  - Including the options proposed in R2-162719 and R2-162232.
  - Including the requirements of each options
  - Including the data forwarding issue.
  - Including the solutions mentioned in R2-162963 and R2-162411.
  - Identify the use scenario for each solution (e.g., SCG change or handover...)
  - Reuse the Table I and the concept of phase in R2-162232
- => Intended outcome: clear details of each solutions including the bullets above. The outcome will be used to further down-selection.

[R2-162519](#) Considerations on SeNB change in DC CATT discussion

=> Not treated

[R2-162444](#) Mobility enhancement for SCG change Samsungother

=> Not treated

[R2-162563](#) Interruption analysis on mobility events ZTE Corporation discussion

=> Not treated

[R2-162565](#) Evaluation of solutions on service interruption enhancement ZTE Corporation discussion

=> Not treated

[R2-162833](#) Scenarios for mobility enhancements in CA and DC Intel Corporation discussion

=> Not treated

[R2-162899](#) Considerations on Solution 1 and 2 for Mobility Enhancements ETRI discussion

=> Not treated

### 8.6.3 Other

No contributions received.

## Summary of the LTE Break-Out session (eVoLTE, Light conn, Mobility enh)

### Agreed CRs

None

### Comeback on Friday

### Mobility enhancement



**CB on Friday** on the draft LS to ask RAN1, RAN3, RAN4 the feasibility and accuracy of the TA measurement in asynchronised and synchronised network for RACH-less solution and common part of solution 2 family if needed.

### Email Discussion

#### eVoLTE:

- ☒ **[LTE/eVoLTE] TR skeleton and capturing agreements (CMCC)**
  - One week to develop the structure of the TR skeleton
  - Until next meeting capture the agreements from this meeting into the TR

=> Intended outcome: Agreed TR version 0.1.0
- ☒ **[LTE/eVoLTE] Identify the potential problems from signalling aspect (Huawei)**
  - Until next meeting
  - Based on the content of R2-162648 and R2-162473

=> Intended outcome: Discussion report to the next meeting

#### Mobility enhancement:

- ☒ **[LTE/Mobility enhancement] Discussion on solution 2 family (ZTE)**
  - Deadline: May 12
  - Including the options proposed in R2-162719 and R2-162232.
  - Including the requirements of each options
  - Including the data forwarding issue.
  - Including the solutions mentioned in R2-162963 and R2-162411.
  - Identify the use scenario for each solution (e.g., SCG change or handover...)
  - Reuse the Table I and the concept of phase in R2-162232

=> Intended outcome: clear details of each solutions including the bullets above. The outcome will be used to further down-selection.

### Agreements

#### eVoLTE:

#### Agreements:

The followings are identified:

1. ECN solution needs all the nodes on the path to behave correctly

Capture the following as the principles of the feasible candidate solutions of codec selection/adaptation

1. Any rate adaptation mechanism introduced by RAN can co-exist with the rate-adaptation mechanisms specified in TS 26.114.
2. Any rate adaptation mechanism introduced by RAN should explicitly indicate the recommended bit rate.

FFS: Any rate adaptation mechanism introduced by RAN shall be codec type agnostic

Confirm that the candidate solutions should be RAN-involved

#### Light connection:

Two work assumption achieved:

- => Work assumption to study the paging enhancement is “S1 connection of a UE lightly connected is kept and active, in order to hide the mobility and state transitions from CN”
- => Light connected UE can be addressed only by the trigger of paging initiated by eNB or MME

**Mobility enhancement:**

None

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## Annex I: LTE Breakout session on NB-IoT

On Tuesday, Wednesday and Thursday of RAN2 #93bis, in parallel to the main LTE session, an LTE Breakout session on NB-IoT was held in room (Mistral C) chaired by session chairman Johan Johansson (MediaTek) addressing:

From Tuesday to Thursday:  
7.14            LTE: Rel-13: WI: Narrowband IOT

The corresponding report of this session R2-163133 was presented and approved on Fri in the joint session and the contents is provided in this Annex I for convenience reasons.

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### 7.14 WI: Narrowband IOT

*(NB\_IOT-Core; leading WG: RAN1; started: Sep. 15; target: Jun. 16; WID: RP-152284)*

*Time budget: N/A*

*Documents in this agenda item will be handled in the NB-IoT Break Out session*

#### 7.14.1 General

*Organization, Requirements, Overall CP/UP aspects*

*Including output of email discussion [93#24][LTE/NB-IOT] Response LS to SA2 (Vodafone)*

##### Incoming LS:

R2-162111    LS on physical-layer aspects of NB-SIB1 transmission (R1-161566; contact: Huawei) RAN1 LS in to: RAN2    Rel-13 NB\_IoT-Core

- Ericsson think that the modification period should be discussed based on papers and that the SIB1 modification period shall be flexible as the normal SI modification period. Ericsson would be fine to have a minimum modification period. There is a contribution.
- Huawei think that SIB1 and MIB modification periods need to be different from other SI modification periods.
- QC wonders what the repetition factors mean, are they needed to take into account different coverage levels? Huawei confirms that this is a cell specific value that represents the worst coverage there.
- Chair wonders what is the relation between HSFN and L1. Huawei think that this is needed to calculate the modification period in order to receive the SIB1. Will discuss later based on contributions.
- We might need to respond. We plan for a LS to RAN1 to respond to all questions in several LSes. FFS if we need to address the questions in this LS.

=> Noted

=> Draft Reply LS in R2-163036 (Huawei)

R2-163036    Draft Reply LS on NB-IoT    Huawei            LS out

⇒ **Section 3 needs update, change WG1 to WG2 in two places**

⇒ **With this update the LS is approved. Final version in R2-163125**

R2-162124    LS of RRC parameter list for NB-IoT (R1-161446; contact: Huawei) RAN1 LS in to: RAN2    Rel-13 NB\_IoT-Core

⇒ **Noted**

- R2-162138 LS of RRC parameter list for NB-IoT (R1-162070; contact: Huawei) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core
- There is a contribution for the introduction of this. We take this into account,  
⇒ **Noted**
- R2-162126 Reply LS to R2-161885 on TS 36.300 section 5 for NB-IoT (R1-161555; contact: Huawei) RAN1 LS into: RAN2 Rel-13 NB\_IoT-Core
- This has already been captured in the stage-2 running CR  
⇒ **Noted**
- R2-162134 Reply LS to R2-161943 on available subframes for paging (R1-161985; contact: Huawei) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core
- We take this into account. ZTE has a slightly different understanding and has a paper.
  - Mediatek think that the main purpose is that We reuse the same formula.  
⇒ **Noted**
- R2-162135 LS on NB-IoT (R1-162065; contact: Huawei) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core
- Huawei indicates that there are contributions.
  - Intel wonders if the non-configurability for multi-PRB means solution 2. Huawei confirms.
  - RAN2 develops an own understanding on how the control of the multi-PRB solution works.
  - CATT wonders to what extent PHR has already been decided? Huawei think this is decided.  
⇒ **We will include replies in the LS that is being prepared to R1 above (Huawei).**
- R2-162136 LS on direct SI update indication for NB-IoT (R1-162068; contact: Ericsson) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core
- Ericsson indicates that there are contributions.  
=> Noted  
=> DRAFT LS reply in R2-163037 (Ericsson)
- R2-163037 Draft Reply LS on direct SI update indication for NB-IoT Ericsson LSout  
⇒ **LS is approved. Final version in R2-153049**
- R2-162137 LS on uplink transmission gap in NB-IoT (R1-162069; contact: Sony) RAN1 LS in to: RAN2 Rel-13 NB\_IoT-Core
- Sony think these “gaps” are not configurable  
⇒ **Noted**
- R2-162117 Reply LS to S3-160337 = R2-161048 on Clarifications on RRC Resume Request (S2-161260; contact: Qualcomm) SA2 LS in cc: RAN2 Rel-13 NB\_IoT-Core
- ⇒ **Noted**
- R2-162118 Reply LS to C1-161430 = R2-162103 on NB-IoT work progress in RAN2 (S2-161331; contact: Qualcomm) SA2 LS in to: RAN2 Rel-13 NB\_IoT-Core, CIOT-CT
- Vodafone point out that this was discussed in CONf Calls with SA2 and we stated there that RAN2 will stick with current agreements. LG agrees. Intel think that CT1 could decide.

- Qualcomm think that low priority has a different meaning than what we have defined for NB-IoT, where we have only two priority levels in access control.
- LG think that it is not clear if CT will introduce low prio indicator or not, and this is related to WaitTime.

=> Noted

=> Draft Reply LS in R2-163038 (Qualcomm)

- R2-163038 Draft Reply LS on per-UE configuration to allow exception reporting Qualcomm LSout
- Ericsson think that for Q1 we should respond yes and explain the use case. Qualcomm explains that this is done in another LS
  - The response to Q2 should be “For NB-IoT RAN2 has assumed a)”
- ⇒ **With this change the LS is approved in R2-163047**

- R2-162119 Reply LS to R3-160135 = R2-161014 on questions on NB-IoT (S2-161333; contact: Vodafone) SA2 LS in to: RAN2 Rel-13 NB\_IoT-Core, CioT
- RAN2 does not have to implement any prioritization between data and signaling.
- ⇒ **Noted**

- R2-162120 Reply LS to R3-160147= R2-161017 on CIOT optimization (S2-161344; contact: Samsung) SA2 LS into: RAN2 Rel-13 NB\_IoT-Core
- If we find that we will not comply to the agreed SA2 CRs we should reply.
  - Ericsson think this means that we implement support for Nas Node selection to select MMEs with different capabilities.
- ⇒ **Noted**

- R2-162122 Response LS to R2-162018 on CioT optimization for non-NB-IoT Ues (S2-161352; contact: Nokia Networks) SA2 LS in to: RAN2 Rel-13 TEI13, CioT, NB\_IoT-Core
- Chair think this means that we need to switch CP->UP solution in one RRC connection but not the other way around. ZTE agrees. Vodafone agrees, and think a consequence is that security need to be started.
  - Vodafone think this need to be supported.
  - NEC think the CP / UP solution can be selected per PDN connection. ZTE think we don't need to consider this because it would be transparent to RAN2.
  - CATT wonders what the use case is for switching CP -> UP solution in one RRC connection. Vodafone think that this can triggered by using new PDN connection.
  - There are contributions on this.
- ⇒ **Noted**

- R2-162128 Reply LS to R2-161948 on paging in NB-IoT (S2-161330; contact: Ericsson) SA2 LS in to: RAN2 Rel-13 NB\_IOT-Core
- QC wonders if this means that the UE reports a DRX although a fixed DRX is used. Ericsson thinks yes. Qualcomm finds this strange.
  - Chair think that from AS point of view, we only receive some garbage values from MME at paging over S2. Intel think that the main problem is in NAS, that the UE can request a UE specific DRX at all.
- Discuss offline (Ericsson)
- After offline discussion Ericsson suggests to take no action.
- ⇒ **Noted**

- R2-162103 Reply LS to R2-160405 on per-UE configuration to allow exception reporting (C1-161430; contact: Qualcomm) CT1 LS in to: RAN2 Rel-13 CIOT-CT
- Qualcomm think that one case of confusion is that CT1 does not know when a UE is configured for this, whether the UE always applies exceptionreport or not, and also why network control is needed.
  - Ericsson think this should be under network control and that there should be test cases. DT agrees.
- => Noted
- => Work offline on a response. Draft Reply LS in R2-163039 (Qualcomm).
- R2-163039 Draft Reply LS on per-UE configuration to allow exception reporting Qualcomm LSout
- ⇒ **LS is approved, final version in R2-163048**
- R2-162104 Existence of CioT support and NAS protocol details for CioT (C1-161544; contact: Huawei) CT1 LS in to: RAN2 Rel-13 CIOT-CT
- On item 1 there are contributions
- => Noted
- => Draft Reply LS in R2-163040 (Huawei)
- R2-163040 Draft Reply LS on Existence of CioT support and NAS protocol details for CioT Huawei Reviewed on-line.
- ⇒ **On-Line edition approved in R2-163044**

- R2-162121 Reply LS to S3-161544 on Existence of CioT support and NAS protocol details for CioT (S2-161345; contact: Huawei) SA2 LS in to: RAN2 Rel-13 CioT
- Ericsson think that SA2 didn't understand the problem, so this is why it is difficult to take the response into account.
  - Vodafone think that this may be different for NB-IoT and WB-EUTRA.
  - Qualcomm think this may grow complex.
- ⇒ **Noted.**

*Above 16 LSs moved from 3.2*

- R2-162142 LS on indication of support of "attach without PDN connectivity" in SIB for NB-IoT and WB-EUTRAN LS in to: RAN2 Rel-13 CioT
- Refer also to offline discussion by Vodafone below
  - Can we agree to introduce such capability
  - ZTE think this is an MME capability. ZTE assumes that for NB-IoT there is no MME capability problem. Vodafone agrees in general but thinks that in this particular case we can have this as it will save NAS signalling.
  - Vodafone think that whatever we respond for NB-IoT should be applicable also for LTE.
  - QC think that as CT1 is insisting we could do this.
  - ZTE wonders if one bit per PLMN need to be broadcasted.
  - Intel indicates that broadcast is not sufficient, but an indication is also needed from the UE to the eNB at Idle -> Connected.
  - Nokai think is it clear that we need this per PLMN
- ⇒ **We introduce a SIB indication to indicate whether “attach without PDN connectivity” can be done or not, to be forwarded in the UE to NAS for control of NAS behaviour.**
- ⇒ **We assume this need to be signalled per PLMN.**
- ⇒ **We also introduce an indication at connection establishment, to be used at attach, in MSG5, whether the connection is for “attach without PDN connectivity” or not.**
- ⇒ **We include the above in the reply LS (to 2104, and 2142). We include the information that for NB-IoT we don't intend to introduce any more SIB indications, e.g. for CP/UP solution support. For WB EUTRA R2 hasn't discussed yet.**

⇒ **Noted**

R2-162143 Response LS on CIoT optimization for non-NB-IoT UEs CT1 LS in to: RAN2 Rel-13  
TEI13, CIoT, NB\_IoT-Core

- The issues are related to RAN2 discussions
- Intel think we don't need to take any action.

⇒ **Noted**

*Above 2 LSs were received during the meeting*

#### **Tdocs for LS reply**

R2-162574 Response to LS on questions on CIoT Vodafone GmbH LS out  
*Outcome of [93#24][LTE/NB-IOT], moved, maybe treated in the main session.*

- Not treated in NB-IoT session

R2-162683 Establishment causes for NB-IoT Ericsson discussion

- LG think that P2 is out of scope of R2, for P4 the motivation is unclear.
- Chair think we already agreed P2 and we don't need to discuss it. Intel agrees.
- LG think that we have three priority layers where one is hidden to the RRC layer for NB-IoT.
- Vodafone and DT would like to strongly state R2 opinion. Huawei support.
- Chair proposes to add 1.1 "RAN2 want to stick to currently agreed cause values for NB-IoT" and 1.2 "In RRC there are only two priority cases mobile originated data for NB-IoT and they are a) normal reporting and b) exceptional reporting, where the first case do not require any particular configuration but usage of the latter one should be under network control." to the proposal 1.
- CATT think that 1.1, 1.2, 1 are good enough, and allows CT1 to select solution. Ericsson and Intel agrees.
- Chair wonders where P3 would be documented. Qualcomm think that this will not be documented anywhere.
- Nokia wonders if Exception reporting can happen on a RRC connection that was established with the cause mo-Exceptiondata.
- ZTE think we don't need to mandate tear-down of connection for transmission of normal data when rrc connection is established with mo-exceptiondata.
- 4a and 4b are not for RAN2. 4c is for RAN2.
- Chair think that 4c is automatically fulfilled ion NB-IoT as resume and establishment can be handled separately. Nokia thinks that non-NB-IoT may be a case.

⇒ **RAN2 want to stick to currently agreed cause values for NB-IoT.**

⇒ **In RRC there are only two priority cases for mobile originated data for NB-IoT and they are a) normal reporting and b) exceptional reporting, where the first case do not require any particular configuration but usage of the latter should be under network control.**

⇒ **RAN2 does not see any AS benefit to support NAS low priority access in NB-IoT.**

⇒ **We should point out in the LS that RAN2 expect to use extWaittime.**

We can check, and if there are problems with the above agreements we can come back.

⇒ **The intention is that the UE shall initiate an RRC connection with cause mo-ExceptionData only to send exception reports.**

⇒ **Exception reports can be sent on RRC connections regardless establishment cause value.**

Can Discuss offline whether The intention is further that the UE shall not use an RRC connection established with cause mo-ExceptionData to send other data than exception reports.

- We did not come back to this. Remains FFS

R2-162600 Open issues of CIoT/NB-IoT CATT discussion

- P1, 2, 4 treated based on other tdocs.

P3:

- Ericsson think that the proposal is not clear. Ericsson are ok to discuss offline
- CATT point out that the intention is to clarify that we don't make specific optimizations for the signalling cases.
- Chair point out that this has already been agreed by SA2

Come back to proposal 3 based on this of other tdoc. Agreement below after comeback

**⇒ The suspended UE shall perform resume procedure, also for access triggered with mo-signalling.**

R2-162557 Response to SA2 on RRC establishment cause Intel Corporation discussion

**⇒ noted**

## **Pass 2**

### **Misc**

R2-162685 Multiple DRBs in NB-IoT Ericsson, Vodafone, NTT DOCOMO discussion

Clarifications:

- Same category, same L2 buffer size, as NB-IoT UE with 1 DRB
- Bearer based QoS differentiation, MAC functions for UL transmission kept as for LTE
- ZTE think that there is UE impact, and ZTE think we need to consider simplifications for multi-DRB NB-IoT UEs, e.g. to have no QoS differentiation. Huawei agrees with ZTE and think this is not needed for NB-IoT.
- DT think we don't need QoS differentiation
- Intel think the number of DRBs impacts the L2 memory requirements.
- Chair think we don't have time to discuss if there are impacts ...
- Neul think that we don't need to signal a capability to eNB.
- Ericsson wonders which part of QoS differentiation except possibly PBR could be removed/discussed. Ericsson point out that we agreed yesterday to use the existing BSR. Ericsson think that we can remove PBR as a clean a simple QoS simplification.
- Vodafone think that there are consequences to not supporting multiple DRBs can be severe. Multiple PDNs support is important.
- QC supports this.
- LG think this is not needed
- TIM think that it is risky to agree to something with unknown impacts.
- Neul wonders if we'd support periodical BSR.
- Chair wonders if the traffic model is the same as for other NB-IoT UEs.
- Ericsson point out that the memory requirement should be the same, as the CP solution already support multiple PDN.
- RAN2 could make no clear assumption: FFS if the number of DRBs will impact memory size.
- Gemalto think we can postpone.

Introduce optional MultipleDRB UE capability applicable with solution 18 (2 DRBs).

After initial discussion:

**⇒ If a clear way forward indicating all impact can be agreed later (short discussion), we Introduce optional MultipleDRB UE capability applicable with solution 18 (2 DRBs).**

R2-163124 Way forward Multiple DRB Support in NB-IOT Vodafone

TIM suggest that we decide now and leave no alternatives open.

⇒ **The NB-IOT UE supporting user plane optimisation can optionally support more than 1 DRB**

⇒ **The higher capable UE supports 2 DRBs**

R2-162723 Maximum SDU size QUALCOMM INCORPORATED discussion

⇒ **Noted**

### **36.300**

R2-162310 36.300 Running CR to Implement Stage 2 Agreements on NB-IoT Huawei draftCR 36.300 13.3.0  
- - B Rel-14 NB\_IOT-Core

### **36.302**

R2-162311 36.302 Running CR to Capture Agreements on NB-IoT Huawei draftCR 36.302 13.1.0 - - B  
Rel-14 NB\_IOT-Core

### **36.306**

R2-162312 UE Capabilities Reporting Huawei, HiSilicon, Neul discussion

R2-162679 UE capabilities Ericsson discussion

R2-162680 Introduction of NB-IoT UE capabilities Ericsson draftCR 36.306 13.1.0 - - B Rel-13  
NB\_IOT-Core  
late

*Above 2 tdocs moved to 7.14.1 from 7.14.2.1*

*Above 5 tdocs were not treated*

## **7.14.2 Control Plane**

### **7.14.2.1 Radio Resource Control - RRC**

*Including output of email discussion [93#40][NB-IOT] NB-IOT ASN.1 structure (Huawei)*

*Including output of email discussion [93#41][NB-IOT] Resume operation (Ericsson)*

*Including output of email discussion [93#42][NB-IOT] Access Control (LG)*

*Including output of email discussion [93#43][NB-IOT] CP solution (Huawei)*

### **Common session - 36.331 Structure ASN.1**

R2-162317 Email Discussion Report on [93#40][NB-IOT] ASN.1 Structure Huawei report

R2-162318 ASN.1 Structure Using Multiple Modules Huawei discussion

R2-162493 RRC structure for NB-IOT Nokia, Alcatel-Lucent Shanghai Bell discussion

*Above 3 tdocs were treated in the common session*

## **CIOT simultaneous CP and UP optimization**

R2-162725 Simultaneous support for CP and UP optimisations QUALCOMM INCORPORATED discussion

*Moved to 7.14.2.1 from 7.14.1*

- Chair think that we might need to support “TM PDCP / no PDCP” -> “normal PDCP” transition also for the attach case, i.e. before a solution has been selected.
- Vodafone agrees that this switch need to be supported.
- ZTE agrees and we only need this, not the opposite switch. Intel agrees.
- NEC agrees with switching, but think that the simultaneous CP and UP solution is different.
- Ericsson think that we shall discuss the attach case. LG agrees and want to discuss whether no PDCP and normal PDCP can exist at the same time.
- Ericsson think that if we support CP solution -> UP solution switch, then overload control doesn't work.
- CATT think there are lots of details that need to be discussed.
- Ericsson think that it should be possible to mandate normal PDCP for DCCH, e.g. in case of UEs / network that only support the CIOT UP optimization.
- Huawei think that CP solution and no PDCP / TM PDCP is mandatory.
- ZTE point out that for Non-NB-IoT this case is different and ZTE support the Ericsson view. Huawei also agrees.
- DT think we should go with the simplest approach,
- LG think we could leave DL PDCP mode up to eNB implementation. Nokia agrees.
- Chair think that for every option there might be a test case.
- ZTE think that we can use no PDCP / TM PDCP

⇒ **In a RRC connection either “TM PDCP / no PDCP” or “normal PDCP” is used. FFS at PDCP mode change, exactly which message uses which PDCP mode.**

⇒ **RAN2 will support “TM PDCP / no PDCP” -> “normal PDCP” change in one RRC connection, but not vice versa.**

⇒ **If security is activated / normal PDCP is used it is not possible de-configure it in an RRC connection.**

R2-162545 RAN impacts of CIoT CP and UP solution for NB-IOT Intel Corporation discussion

P6:

- Chair think that we could consider even adding DRB established as a condition for allowing suspension.

⇒ **To confirm that data could be sent over CP and UP within the same RRC connection.**

⇒ **RAN2 previous agreement "The NB-IoT UEs will not use / transfer data using CP solution and UP solution at the same time, i.e. both will never be configured by the network at any point in time " is not valid.**

⇒ **UE in connected mode with AS security not activated (i.e. no UP) can only be released into idle (i.e. no suspend)**

⇒ **UE in connected mode with AS security activated can be released into idle mode or idle mode with the suspend indication.**

R2-162886 Simultaneous support of CP and UP solutions NEC discussion

⇒ **Noted**

## **CIoT indications**

R2-162357 Considerations on CIoT indications in NB-IoT ZTE discussion

P1

- ZTE and Huawei would like to progress this during this week

P4:

- Vodafone think that CP is mandatory also for the network.
- ZTE think this is reasonable. Ericsson think that CP mandatory is only for UE and not for network.
- TIM think that this is handled by NAS signalling in the Attach. CATT agrees and wonders what it means? Chair think that this is only useful if we have scenarios where deployments are very heterogenous. Qualcomm don't think that SIB signalling is very useful unless it is to affect mobility.
- ZTE agrees that the intention is to control mobility.
- If there are certain deployments where certain solution is not deployed
- Ericsson think that MMEs have different capability.
- Nokia think that it is up to UE logic which solution to use in some cases.
- Vodafone do not want to agree to this. CP solution is mandatory. Huawei and MTK agrees that CP solution is mandatory. Huawei also do not want to agree to this.
- Huawei think that it is difficult to indicate the MME capability in AS. ZTE think that this is not just an MME capability.
- Ericsson think that we agreed to treat CP solution as mandatory only from the UE point of view. Docomo agrees, and think the SIB solution is needed.
- LG think that SI signalling should only be there when we see UE impact.
- Intel think that all network nodes in a TA-list have the same capability.
- Intel and Huawei think that "attach without PDN connectivity" may be a necessary SIB indication. Ericsson agrees. Vodafone would support such indication. ZTE think this should be resolved in NAS.
- **Chair summary:** There is significant support, but also objections, no agreement possible regarding SIB network capabilities.

Offline Way forward on SIB indication for attach without PDN conn (Vodafone).

- Email discussion was held
- 8(10) companies think there is a need for a SIB indication.
- We will support a SIB indication for this case, see Discussion on LS

Invite for offline way forward (ZTE) on the FFSes for control of TM PDCP/no PDCP vs full PDCP.

- ZTE indicate that there was not so much participation in the offline. ZTE point out that as we have no switch-back we need significant rediscussion if we reopen.
- Proposal is that "before Security is started we always use no PDCP". Neul, QC, CATT support this
- Nokia think that for networks that support UP solution only there is no need for this. And that full PDCP can be used. Vodafone think we don't have such networks.

⇒ **Before Security is started we always use no PDCP**

R2-162543 CIoT indications in SIB and msg.5 during attach procedure for NB-IOT Intel Corporation discussion

P1:

- Huawei think that CP solution is mandatory, and capability is not needed. Intel think that P1 is in line with SA2 assumptions
- Nokia think that UE capabilities are discussed in the end, and can be left FFS.
- VDF indicates that this is the end of the release.

⇒ **We define a new optional flag as part of msg.5 carrying NAS Attach/TAU (i.e. RRC Connection Setup Complete) for the UE to indicate its support of (1) CIoT UP solution - AS context caching.**

## Control of PDCP mode

R2-162856 Introducing SRB3 for NB-IOT LG Electronics Inc. discussion

- Neul wonders which SRB is used for the MSG5 complete message
- LG think this may depend on which SRB is used for the MSG4
- Intel support to indicate by LCID whether PDCP is used or not, but would prefer to still call the SRB SRB1.

Proposal: Define SRB3 to support L2 operation with "no PDCP / TM PDCP".

The SRB3 is same as SRB1 except that PDCP is not applied.

=> Noted

R2-162548 PDCP transparent mode for NB-IoT with CIoT CP solution Intel Corporation discussion

*Moved to 7.14.2.1 from 7.14.3.2*

- ZTE think that these proposals makes sense if we start with the transparent mode (without PDCP).
- Nokia wonder if this is applicable to DL or UL. LG think both.
- Intel clarifies that the intention is not to change how the SRB0 is used, and that as soon as SMC has been sent/received SRB with security shall be used.
- Neul wonders what this will mean for configuration.
- Intel think that the configuration that is needed can be the *\_same\_* as for SRB1, i.e. no additional information is needed.
- Nokia wonders if this is applicable to both CP and UP solution. Intel thinks yes.

- ⇒ **RAN2 agree to use a LCID indication to distinguish when “PDCP-TM / no PDCP” vs “full PDCP” is used for the SRB.**
- ⇒ **For a UE using the SRB with PDCP-TM / no PDCP, AS security can be activated by a Security Mode Command (which is then sent on SRB1, i.e. with full PDCP).**
- ⇒ **After AS security is activated, the SRB with PDCP-TM / no PDCP is no longer used for the duration of the RRC Connection. Instead the SRB1 with full PDCP is used.**
- ⇒ **The transmissions with PDCP-TM / no PDCP are done on a separate SRB which is called SRB1bis, and is using the same configuration as SRB1 except for PDCP.**

R2-162638 PDCP functionalities for NB-IoT solutions Nokia, Alcatel-Lucent Shanghai Bell discussion

*Moved to 7.14.2.1 from 7.14.3.2*

*Not Treated*

### **MSG 3 - Data Volume Indication**

R2-162645 Solution preference and data volume indications for NB-IoT Nokia, Alcatel-Lucent Shanghai Bell discussion

In a first pass we only treat P5 and P6

- Qualcomm wonders if excluding signalling data would exclude SMS. Nokia didn't consider SMS. Vodafone wonders why Nokia didn't consider SMS. Vodafone think that SMS should be included.
- LG wonders if the user data is for established or not yet established bearers. Nokia think that the data is for both CP and UP solution i.e. not established or not yet resumed bearers.
- LG think that the data volume in DVI should not include established but not yet resumed bearers.
- Neul wonders why we exclude signalling information. Ericson think we can include the signalling information. QC and CATT agrees.
- Nokia think that if we include both signaling and user data we lose the ability to prioritize. For the UP solution we have separate signalling and data.
- Docomo think that we anyway cannot separate signalling and user data.

- ⇒ **The data volume in MSG3 indicates the amount of user data (including SMS) and NAS signalling data volume sent over user plane or control plane.**
- ⇒ **The data volume is reported as one single number.**
- ⇒ **When resume is performed it always resumes all suspended DRBs.**

R2-162483 Discussion on dedicated SR for NB-IoT NTT DOCOMO INC. discussion

- Ericsson think that there is HARQ feedback after message 4 and when this is received the eNB can assume that the UE is ready to be scheduled according to DVI. Ericsson think there will be plenty of time for the UE. ZTE agrees.
  - Docomo think that the HARQ feedback is not reliable.
  - Ericsson think that the eNB will retransmit message 4 if the HARQ feedback isn't received.
  - QC wonders if for later transmissions the UE will need to perform a SR and whether this is a problem or not.
  - Docomo think that SR is needed and that D-SR is beneficial.
  - LG think that Docomo observation is correct. LG point out that if existing BSR triggering is used then BSR/SR will be triggered immediately upon reception of MSG4. Ericsson think we can use the SR prohibit timer, and there is no problem. Huawei think D-SR has big impact of the current system for RAN1.
  - Chair: limited support, several companies think that there is no problem.
- => Noted

R2-162599 How to construct the volume indication CATT discussion

R2-162900 Data Volume Indicator for NB-IOT LG Electronics Inc. discussion

R2-162921 Data Volume Indication Mechanism in NB-IoT Samsung Electronics discussion

Above 3 documents were not treated

### MSG 3 - General

R2-162355 Msg3 in NB-IoT ZTE discussion

- Vodafone agrees that for legacy system, alt 2 may be problematic, but could be the simplest way forward for NB-IoT. Ericsson, MTK, Huawei, LG, Intel and Nokia agrees.
  - Docomo think we should be careful to not overallocate resources and agrees with ZTE. Ericsson wonders what would be saved? Power consumption?
  - Qualcomm agrees that fixed size is simple, but in the case of short data transmission the extra number of bits may be significant. ZTE agrees with this, and point out that the size of MSG3 is not large compared to the complete amount of data and the size difference between the small and large size is significant.
  - Sony also support to have a flexible MSG3 size.
  - Intel point out that the possible sizes are 56, 72, 88 bits acc to RAN1 agreement.
  - Ericsson think that the PRACH partitioning itself is a problem, and we'd need to spend time to make it work well or just do a very rough partitioning which result in a shortage of PRACH resources.
  - Qualcomm think that the network cannot know which TBS to allocate.
    - o Chair think that there are several possibilities:
      - To use the alt 2 approach in the doc, i.e. to always allocate acc to worst possible case, and both resume and establishment are possible.
      - Restrict the network such that only establishment is possible (no UP solution) and then the smaller TBS can always be used ..
  - Chair: On Alt1, There is some support but also significant opposition.
  - Chair: We don't pursue any AS enhancements for handling different TBS for MSG3 in rel-13, we assume that the network ensures that sufficient TBS is always allocated.
  - ZTE think that if there is a risk that the TB size provided is too small for the UE, then we need to handle that case in the Specs.
- => Noted

R2-162550 Remaining aspects of message 3 for NB-IoT Intel Corporation discussion

P1, P2

- P1 and p2 were modified based on the understanding that R1-agreed TBS for MSG3 could be 56, 72 or 88 bits

- Qualcomm is concerned that a UE that is configured for UP solution will move into a network that only supports the CP solution and there will attempt to perform a resume which will not be possible.
- Vodafone think we should design all UL CCCH messages for the grant size of 88 bits. Intel and Huawei agrees.
- DT would be fine with the proposals.
- Vodafone think that neighbor cells will have different capabilities.
- Sony and ZTE think we should have different TBS for different messages.

⇒ **RAN2 agrees that the necessary message 3 contents can be accommodated within a 88bits TB size for NB-IoT**

⇒ **88bits is the only TB size that is assumed, when specifying support for UL CCCH**

⇒ **RAN2 to agree that a 4-bit DVI is to be accommodated within msg 3**

R2-162661 Necessary IEs in message 3 NTT DOCOMO INC. discussion

⇒ **noted**

R2-162634 Considerations on Resume ID Sony discussion

⇒ **noted**

R2-162772 MAC aspects on DVI, BSR, PHR, etc for NB-IoT Ericsson discussion

P6

- Ericsson explains that the use case is access control, i.e. in order to do a reject with ext wait time. Docomo thinks that another use is that the eNB shall be able to route to the correct MME.
- Neul think that in order to route to correct MME, indication in MSG 5 is sufficient.
- Intel don't understand the motivation for this proposal. ZTE think that the motivation is different in the tdoc and think that this is not needed.
- Ericsson think that for some accesses we cannot differentiate CP and UP solution and cannot differentiate access control.
- QC point out that Data over NAS may happen also when UP solution is used
- LG would be ok with this but doesn't want the indication in MAC
- Chair: there is weak support, we don't pursue this in Rel-13.

#### Additional Contents of MSG3

Multi-Tone support.

- Huawei indicates that the multi-tone PRACH indication is only for MSG3, so this is needed. Vodafone think that the PRACH partitioning is optional and assumes this is needed. ZTE has the same view as Vodafone.
- Ericsson think we can rely only on the PRACH selection mechanism and this info is not needed in MSG3. Docomo think that this is not needed and can be part of normal UE capability handling. LG agrees and think that PRACH partitioning can work.
- Intel think this information is not essential.
- TIM think that the discussion is not reasonable, and we can probably request more bits if needed. Huawei indicates that 88 bits TB size is the current assumption in R1.
- Intel think we should only add this for the CP solution, for the establishment request
- Sony points out that the multi-tone capability bit should be interpreted as an IOT bit.

⇒ **We introduce a multi-tone UE capability indication in MSG3 for the RRC Connection Request.**

⇒ **The multi-tone UE capability is also needed in the “normal” capability signalling.**

⇒ **the multi-tone capability bit should be interpreted as an IOT bit (inter operability test).**

### **Multi-PRB support**

- Huawei think this is mandatory for the UE. Ericsson agrees and think an IOT indication is not needed.
  - TIM wonders if this will be available in the network so we might need an IOT indication. TIM are concerned about time to market.
  - Intel want to have this functionality optional. DT think it is not complex.
  - Neul wonders if there will be IOT opportunities.
- ⇒ **We introduce a multi-PRB UE capability indication in MSG3 for the RRC Connection Request.**
- ⇒ **The multi-PRB UE capability is also needed in the “normal” capability signalling.**
- ⇒ **The multi-PRB capability bit should be interpreted as a an IOT bit (inter operability test).**
- ⇒ **We can revisit this if there is new information later.**

### **PHR**

- ⇒ **PHR 2 bits is included in MSG3**

We assume 88 bits TBS below, but this may need to be confirmed with RAN1.

Resume 88 bits (indications in RRC)

- Resume ID 40 bits
- Est Cause 3 bits
- Short MAC-I 16 bits
- DVI (rrc) 4 bits
- **PHR (rrc) 2 bits**
- MAC Overhead 8 bits
- RRC Overhead 4 bits
- **RRC Spare 11 bits**

Resume 88 bits (indications in MAC)

- Resume ID 40 bits
- Est Cause 3 bits
- Short MAC-I 16 bits
- **DVI (mac) 4 bits**
- **MAC spare (mac) 2 bit**
- **PHR (mac) 2 bits**
- MAC overhead 8 bits
- RRC Overhead 4 bits
- **RRC Spare 9 bits**

We assume 72 bits TBS below, but this may need to be confirmed with RAN1.

RRC est 72 bits (example, indications in MAC)

- UE ID 41 bits
- Est Cause 3 bits
- **DVI (mac) 4 bits**
- **Multi-tone (mac) 1 bit**
- **Multi-PRB (mac) 1 bit**
- **PHR (mac) 2 bits**
- MAC overhead 8 bits
- RRC Overhead 4 bits
- **RRC Spare 8 bits**

### **PDCP model NAS recovery**

R2-162320 Report of the email discussion [93#43][NB-IOT] CP Solution Huawei report

- LG is wondering whether NAS recovery is really needed. AS layer do not know whether NAS recovery is needed, but the NAS layer knows this, so NAS layer should decide. Intel agrees.
- Huawei think that the requirement comes from RAN2, although the spec is in NAS layer.
- Intel think that NAS layer will decide if NAS recovery is needed or not based on whether more data need to be sent.
- ZTE think that no new behaviour is needed.

⇒ **The NAS recovery is needed when UE enters RRC\_IDLE following RLF for the CP solution, at least where there is more data for transmission.**

⇒ **The NAS layer can decide if to trigger NAS recovery.**

⇒ **the existing release cause value 'RRC Connection failure' can be used to inform NAS layer when UE enters RRC\_IDLE following RLF for CP solution.**

⇒ **We need to inform CT1 about the above agreements on NAS recovery for CP solution, include in above LS to CT1 (Huawei)**

R2-162857 Need for PDCP TM in NB-IOT LG Electronics Inc. discussion

- Intel think this means that we say in specs that “PDCP is not used”.
- ⇒ **For CP solution in NB-IOT, the SRBs bypass the PDCP entity**

### **NAS recovery**

R2-162871 Release Cause Indication at RLF LG Electronics France discussion

⇒ **noted**

R2-162554 Need of NAS recovery and RLF/RLM triggering Intel Corporation discussion

⇒ **We confirm that for Solution 18 (i.e. UP Optimisation Solution), RRC Connection Re-establishment should be performed due to radio link failure (as in legacy LTE, because AS security is activated).**

⇒ **We confirm that once AS security activated (when at least UP Optimisation Solution is used), if RRC Connection re-establishment fails, the UE considers the RRC connection is released with release cause “RRC Connection Failure” to trigger NAS recovery.**

R2-162659 NAS Recovery for NB-IoT UE NTT DOCOMO INC. discussion

⇒ **noted**

### **UP solution - General**

R2-162506 Report of the email discussion [93#41][NB-IOT] Resume operation Ericsson report

P2:

- Intel wonders if the establishment messages can be used.
- Ericsson think that there will be common procedure text between RRC establishment and RRC resume.
- Ericsson think that the resume message is different, and the request message is also different. Reject message and complete message is similar to the establishment reject and complete messages.
- Neul wonders what “existing” means? Intel think it means reusing LTE messages. Intel think that even maybe RRCConnectionResume
- CATT point out that we might not need to sent the Mandatory NAS information in existing setupComplete message in the resume procedure.

- LG think that Alt2 is cleaner.
- Neul think that only the reject message is the same. For the other messages the contents will be different. The chair shares this view.
- Intel think that If the eNB does not have the valid UE context the recovery in the form of setup can be done. Ericsson confirms.

P3:

- Nokia asks why the reconfiguration message in option 2 is mandatory. Ericsson explain that this is for security reasons. Intel has the same understanding. At least one DL message need IP. Nokia think this could be any message. Intel think that for delta configuration we need a reconfiguration message so it is natural to use it. ZTE agrees with Nokia.
- LG think that option 1 is very natural as we already have security setup.
- Huawei wonders if we anyway always have a reconfiguration message. Ericsson think that we don't always need a reconfiguration, and also reconfiguration IEs can be included in the resume message. Huawei think we didn't agree to have any reconfiguraiton IEs in the Resume. Intel point out that if ciphering is not needed then it is easy to just include those in the resume.
- Ericsson think that option 1 is similar to SMC.
- ZTE wonders if RRC connection reject is sent on SRB0 or SRB1. Ericsson wonders why it wouldn't be SRB0.

P4:

- It was already agreed that key transformation based on provided NCC value is done at every resume, and that count is reset. No need to re-agree this.
- Huawei think that the consequence is that NCC in MSG4 need to be mandatory,
- Ericsson think we can also reuse T302 in the same way as T300. Neul point out that this is the wait time and we have agreed to only have one wait time.

P6:

- Chair wonders if this means that ROHC cannot resume. Huawei think so, and would prefer another model where the protocols are just suspended and resumed. HUawei think this means that we don't need to specify a variable etc. Ericsson support this view and think that this is the re-establishment model. Neul wonders what is the reestablishment model. Ericsson think that the configuration and state is just kept in the protocol. Blackberry and Intel also support this. Huawei think that the reestablishment model would progress faster as we don't need to specifie a variable.
- Docomo think that the release-model is similar to current Idle mode protocol states. ZTE and LG support this model.
- Ericsson thought that this is mainly a model, and state storage could be part of this.
- Intel think that if we don't specify a variable, then the two approaches are equivalent.
- Ericsson think that ROHC need to continue. Vodafone agrees.
- Docomo thinks that ROHC is not needed.
- Docomo is wondering why we need delta config.
- Qualcomm think that a full configuration is useful. Ericsson think there are fallback options, so it is not celar that full configuration is needed.

P9

- LG think we don't need this
- Vodafone think that the consequence of not having this is that the eNB should be able to reject a resume request such that the UE doesn't attempt another resume.
- Intel want to have the opportunity to discuss this later. Intel think that there could different UE behaviour on reject depending on the reason for reject ..
- The chair think that The case when eNB doesn't understand resume request is not applicable for NB-IoT.
- ZTE don't want to do this, we discussed this at length yesterday
- Chair: No consensus. Not possible to agree to this.

Reject

- Intel think that in case of reject the UE stays suspended, but at setup the stored UE context is removed and not used. Furthermore there should be an option to remove the UE context and go to Idle.
- Huawei wonders why the UE should go to Idle (non suspend) at reject. Ericsson think there is a case when eNB doesn't understand the context but the eNB doesn't want to do an immediate establishment, e.g. due to load .. Huawei think the only case of reject is overload, so setup or reject (with kept context) should always work.

- CATT wonders if we really shall reuse the reject message now, when we introduce NB-IOT spec parameter.

**For the Resume procedure:**

- ⇒ Introduce new RRC message **RRCConnectionResumeRequest**, **RRCConnectionResume**, **RRCConnectionResumeComplete**
- ⇒ Use existing RRC messages **RRCConnectionSetupReject** as a response to **RRCConnectionResumeRequest**
- ⇒ The RRC Resume message is sent on SRB1 with Integrity Protection, and optionally a **RRCConnectionReconfiguration** message is sent on SRB1 with Integrity Protection (and Ciphering)
- ⇒ The reject message is sent on SRB0.
- ⇒ We confirm that key transformation based on provided NCC value can be done at every resume, and that count is then reset. This is done at every Resume.
- ⇒ The existing timer T300 is used for the RRC Resume procedure. The range for NB-IoT is FFS but can be the same for resume and establishment. Start/Stop conditions are as for LTE, but references to new messages for resume need to be added.
- ⇒ It shall be possible that ROHC can continue at resume.
- ⇒ We will not specify a UE internal variable with the detailed UE context to be stored at suspend.
- ⇒ The protocol entities for PDCP and RLC are kept when the RRC connection is suspended, and are re-established at RRC Resume.
- ⇒ MAC is reset at resume.
- ⇒ The UE will store it's full Context at RRC Suspend, i.e. Configuration, security information, ROHC protocol state (i.e. nothing is released).
- ⇒ Up until reception of Msg 4, default configurations are used by the UE.
- ⇒ The configuration for the SRB1 transmission of MSG 4 is as follows: L1 and MAC: default configuration, SRB1 configuration is the configuration of the stored UE context.
- ⇒ The dedicated radio configuration in Msg 4 is a delta for the configuration in AS context.
- ⇒ If the delta configuration cannot be used or the resume cannot be executed at the eNB the eNB initiates either a reject or a setup.
- ⇒ At reject the UE stays suspended and keeps the stored UE context, or removes the stored UE context and goes to Idle, based on indication in the reject message.
- ⇒ At connection setup the stored UE context is removed and not used.

R2-162692      Draft CR to capture outcome of mail discussion on RRC Resume operation      Ericsson      draftCR      36.331  
13.1.0 - - B      Rel-13NB\_IOT-Core  
late  
Not treated

R2-162356      Remaining issues for UP solution ZTE      discussion

**P4**

- Huawei have concerns on this proposal. Huawei proposes to use the current input (as for reestablishment) for the short MAC-I calculation.
- ZTE think that the purpose of the MAC is integrity protection for the signalled data. Huawei doesn't think so. Ericsson think it can be ok to use the current input to the algorithm. Ericsson think that anyway it is easy to change this, and there is no impact to ASN.1 for signalling protocol.

- Intel think we should leave this to SA3. ZTE think SA3 has not started to look at this. If we need SA3 to look at this we should send an LS.
  - Huawei indicates that for non-NB-IoT case the resume ID may be smaller, and this should be indicated in the LS.
- => Noted
- => CB Friday: Draft LS to SA3 in R2-163041 (ZTE), where we (to some extent) indicate the proposals on the table in RAN2 and ask SA3 to decide,

R2-162866 Security aspects of NB-IoT Ericsson discussion

P3 and 4

- Huawei think that such reconfigurations can be put into a reconfiguration message, so this is not needed.
- Intel think we should discuss p5 first.

P5:

- Chair wonders if the response messages can be sent in the same TB.
- Intel think that the RRC processing is specified as sequential, so there is nothing in the specifications (current) that would ensure that the response messages would go in the same TB.
- Huawei think there may be a security problem is complete message is omitted according to disc at previous meeting. Chair recalls that the requirement discussed was to have one message in the UL with full security to complete the resume, so this should not be a problem.
- Huawei think this is complicated, and that this is not needed of this is a rare case ..
- Docomo think we don't need to sent the reconfiguration at the same time as the resume. This is an optimization for the case when we want to reconfigure a suspended SRB or DRB. Docomo think this doesn't need to be optimized.
- Intel think that we will have 2 additional messages for resume if the proposals 3, 4, 5 are not agreed. Neul think that this is true but only in the cases when reconfigurations are needed, which should not be frequent.
- QC wonders if one message may be corrupted and another message not.
- Intel think that we can have L1 reconfigurations in the resume message. Ericsson adds that also MAC reconfiguration can probably be done without security. HUawei agree that MAC and L1 reconfigurations can be present in the resume message

P6:

- ZTE wonders how there can be data for transmission at MSG4 for resume. Vodafone wonders if there really is a DRB at MSG4. Ericsson think that we don't need to care, but should focus on which point in time the UE can expect ciphered data etc.
- Huawei think that network bearers have anyway not been resumed / setup at this point, so no DRB transmission can happen at MSG4.
- Neul think that it is not so easy for the UE.
- QC point out that MSG4 could redirect the UE to non-anchor PRB and the UE would not be ready to receive anything until the UE has fully received and processed MSG4 CP message.
- QC think that the UE either responds to a page or there is MO data, and for none of these cases it si required to send data at the same time as "message 4".

- ⇒ **We make the assumption that L1 and MAC configuration parameters can be present in the RRC connection resume message without ciphering.**
- ⇒ **Ask SA3 to clarify whether integrity protection and/or ciphering is needed for SRB/DRB configuration/reconfiguration at RRC connection resume.**
- ⇒ **If SA3 indicates that also SRB/DRB configurations can be present in the RRC resume message then we add that possibility later.**
- ⇒ **UE can receive data on DRB after having received and processed RRC resume message.**
- ⇒ **The UE is not required to be able to receive data on DRB and the RRC resume message in the same TB.**

⇒ **Security is fully resumed on UE side after reception and processing of RRC connection resume message and UL data on DRB(s) can be sent with “message 5”.**

⇒ **We inform SA3 of the above security related agreements**

R2-162485 UP modelling for U-plane solution NTT DOCOMO INC. discussion

⇒ **noted**

R2-162552 Open aspects of UP solution for NB-IoT Intel Corporation discussion

P3:

- Vodafone think it is obvious that this is the case, but the “UE implementation” is confusing and should be removed.

P4:

- Ericsson agrees with Intel that this is needed.
- Docomo think that S-TMSI doesn't need to be sent in MSG5. Vodafone agrees
- Chair think that the consequence of not providing S-TMSI is that MME relocation is triggered.

P7:

- Ericsson think that the resume are is larger then tracking areas. Intel explains that the reason for this proposal is that eNB within a TA-list supports the same CIOT optimizations.
- Ericsson think that we agreed that all networks need to support reject message so we don't need more mechanisms.
- Chair: Not much support.
- Docomo want to verify that resume ID can be applied in a larger scope than TA lists etc, preferably network-wide. Intel think that SA2 has agreed on TA-list.

⇒ **We inform SA2, R3 on the agreements for handling eNBs of different capabilities.**

⇒ **RAN2 assumes that it is up to the NAS layer to choose how to continue after a failure when Resume procedure fails, when the context has been removed in the UE**

- **RAN2 assumes that NAS may choose between establishing the DRB or using CP solution for NB-IoT**

⇒ **RAN2 assumes that as long as there is a stored UE context in the UE, the UE will always attempt resume.**

⇒ **For connection establishment cases where S-TMSI is today sent msg 3, triggered by setup as a fallback to a failed resume, the S-TMSI is instead sent in msg 5.**

R2-162559 Bearer id list in Resume message 3 for NB-IoT Intel Corporation discussion

Document above not treated.

R2-162558 Bearer id list in Resume message 3 for NB-IoT Intel Corporation discussion

*Moved here from TEI13*

⇒ **We do not introduce RAN level bearer synchronisation and the bearer list during suspend and resume procedure;**

⇒ **inform SA2, draft LS in R2-163126 (Intel)**

Comeback friday

- R2-162598 Consideration on open issues of resumption CATT discussion
- R2-162644 NB-IoT – Further details on RRC suspend and resume Nokia, Alcatel-Lucent Shanghai Bell discussion
- R2-162867 Further aspects of RRC Resume and Resume Id Ericsson discussion

#### **UP solution - Reject Failure Fallback**

- R2-162938 The reject procedure of RRC connection resume request in solution 18 LG Electronics Inc. discussion

Above 4 documents not treated

- R2-162865 RRC Resume AS-NAS interaction Ericsson discussion
- LG Proposes another model, where NAS message is cached in AS.  
P2
  - Ericsson think that this is needed.  
P3
- ⇒ **We agree the following 3 items as a baseline, and change in case CT1 has agreed differently**
  - ⇒ **Connection initiation is triggered when upper layers request establishment or resume of an RRC connection.**
  - ⇒ **When RRC connection resume message has been received, UE RRC indicates to upper layers that RRC connection has been resumed.**
  - ⇒ **When RRCConnectionSetup is received in response to RRC connection request, UE RRC indicates to upper layers that RRC connection resume has failed.**

- R2-162939 UE internal NAS-AS interaction to perform RRC connection resume procedure LG Electronics Inc. discussion
- R2-162597 Discussion on RRC connection setup handling in RRC connection resume procedure HTC Corporation discussion
- R2-162596 Further discussion on NB-IoT resume failure HTC Corporation discussion

#### **UP solution - Terminology**

- R2-162324 Terminology for NB-IoT Solution 18 Huawei, HiSilicon, Neul discussion

#### **UP solution - Optimizations**

- R2-162887 Procedure for mo-Signaling after RRC suspended NEC discussion
- R2-162736 Early RRC Connection Release for UP solution Sequans Communications discussion

Above 6 documents not treated

### **Pass 2**

#### **36.331**

- R2-162314 36.331 Running CR to Capture Agreements on NB-IoT Huawei draftCR 36.331 13.1.0 - - B  
Rel-13 NB\_IOT-Core

This is the CR that was endorsed for the RP, and it was provided for information

⇒ **Not pursued**

R2-162315 36.331 Running CR including ASN.1 Huawei draftCR 36.331 13.1.0 - - B Rel-13  
NB\_IOT-Core

This is as 2314 but with added ASN.1

- Question whether we need to have inter-node message for context fetch
- We need to to default configurations.
- The two-module approach was used. Almost Nothing was changed in the LTE module.
- Nothing has been changed in the LTE module for the moment. Neul think that for CIOT optimizations for LTE we can always move common things to the LTE module (or duplicate), but we don't need to do that now.

First this CR was Endorsed as baseline, but it was later agreed to work offline on another version

⇒ **Not pursued**

R2-162316 36.331 Running CR Implementation Huawei, HiSilicon, Neuldiscussion

⇒ **Noted**

R2-162968 Comments on 36.331 Running CR to capture agreements on NB-IoT Ericsson discussion

- Ericsson think that for functions that are optional for LTE that are not applicable for NB-IOT we don't need to do "distributed" NB-IoT non-applicability tagging. Nokia agrees, and think that tagging in this case only makes things less clear.
- Neul points out that it is sometimes not clear what is optional in the text, and there are some cases where the network will not provide a service, i.e. that is not about UE optionality.
- QC and the chair think it doesn't matter whether tags are at the beginning or the end, but thisnk that the important thing is to make the applicability to NB-IoT clear for LTE mandatory functions
- Himke observes that in quite many cases the separation approach has been taken, where integration could have been used instead and might help when we support CIOT optimization for both LTE and NB-IOT.
- DT think that the Ericsson CR is not clear. Vodafone think that the Neul CR is easier to read.
- Chair think that integration is mostly important for the CIOT functionality, i.e. suspend resume ..

Potential ways forward ..

(general) Agree that we don't do distributed NB-IoT tagging for LTE optional features.  
(general) ON case by case basis, reduce the number of tags / applicability statements.  
Attempt higher level of Integration for CIOT functionality, and common procedures,

Offline, list of sections and procedures, and suggested way forward (Ericsson, Neul).

=> Noted

R2-163054 36.331 36.331 Running CR to capture agreements on NB-IoT Huawei draftCR 36.331  
13.1.0- - B

- This is the result of offline effort

⇒ **Endorsed as baseline for further work**

R2-162969 36.331 CR to capture introduction of NB-IoT Ericsson draftCR 36.331 13.1.0 - - B Rel-13  
NB\_IOT-Core

⇒ **Not pursued**

- R2-162321 RRC Remaining Issues Huawei, HiSilicon, Neul discussion
- P1
- Ericsson think that it need to be described that keys can be changed and would like to provide more details.
- P4
- Intel wonders if we need a table at all.
  - Chair think we can refer to UE capability instead when explaining applicability of procedures.
- P6
- Ericsson wonders if this is mandatory.
  - Neul think it is mandatory but is optional in legacy bec it only applies top certain types of UEs.
  - Qualcomm point out that for NB-IoT NAS should ignore the extended Wait Time for Exception report.
- P8
- The chair proposes to not consider PPI and clarify this Now.
  - Ericsson, sequans and Nokia think PPI can be used for fast dormancy.
- ⇒ Remove the editor's note and clarify that w.r.t RRC connection mobility in NB-IOT, only RRC context information transfer is supported and that key change at resume is supported (but no re-keying).
- ⇒ RAN2 to confirm that there is no need to require the UE not to apply the timeAlignmentTimerCommon at the time of reading SIB2 for NB-IoT, so the editor's note can be removed.
- ⇒ RAN2 to confirm that no further update to section 5.3.1.4 is anticipated and the editor's note at the start of the section can be removed.
- ⇒ An extendedWaitTime parameter, defined with the legacy range, can be included in RRC Connection Reject message and is forwarded to the upper layers when present.
- ⇒ RAN2 to confirm that there is no waitTime parameter included in RRC Connection Reject message and that T302 is not applicable to NB-IoT, so the editor's note can be removed.
- ⇒ RAN2 thinks that NB-IoT NAS should ignore a running "extended Wait Time"-timer for Exception report, as this is considered high priority.
- ⇒ The non-anchor carrier configuration is provided in IE PhysicalConfigDedicated

### 36.331 – Particular Configurations

- R2-162319 Report of the unofficial email discussion on ASN.1 for dedicated radio resource configuration  
Huawei discussion  
late
- ASN.1 parameter naming with/without "-NB"
  - IF we have multiple DRBs, it need to be decided now ..
- ASN.1 parameter naming with/without "-NB"
- Do we keep or remove the "-NB"
  - We only refer to parameter names in procedure text.
- ⇒ We don't use the "-NB" in the parameter name
- ⇒ We still use "-NB" in parameter types
- P1.1
- Ericsson think that we should assume multiple RB both for SRB and DRB and use same structure as for LTE for extensibility.
- P2
- Treated in other docs

- ⇒ **Keep the structures proposed DRB DRB-ToAddModList-NB-r13 and DRB-ToReleaseList-NB-r13 as well as the legacy definition of the parameters.**
- ⇒ **Assume multiple SRBs in the structure for SRB-ToAddMod-NB-r13**
- ⇒ **t-StatusProhibit is not needed.**
- ⇒ **legacy parameter maxRetxThreshold is reused.**

Related to multiple DRBs

- ⇒ **We don't support prioritisedBitRate and bucketSizeDuration (even in the case of multiple DRB).**
- ⇒ **logicalChannelSR-Mask is not needed.**
- ⇒ **ttiBundling is not needed.**
- ⇒ **Keep the option of configuring dedicated timers, using the legacy structure and parameters definition for RLF-TimersAndConstants.**
- ⇒ **Keep the legacy value ranges of n310, n311 and T311.**

R2-162322 PHY Configuration - ASN.1 aspects Huawei, HiSilicon, Neul discussion late

P1

- We settle the si-TBS at the adhoc meeting, FFS for now.

P3

- coding of nrs-CRS-PowerOffset is FFS, to be discussed offline in RRC review.

P4

- Do we use the LTE structure and have a placeholder for TDD? i.e. a choice FDD TDD.
- Huawei think we don't need to discuss now

- ⇒ **We don't use MBSFN subframe configuration**
- ⇒ **For SI, we don't have TDD / FDD choices, instead we make FDD specific parameters optional.**
- ⇒ **We endorse the proposed IE structure and proposed field descriptions (as a baseline)**

R2-162769 UE Reconfiguration to a Non-Anchor Carrier in NB-IoT Ericsson discussion

- Ericsson assumes that carriers in multi-PRB operation may be of different deployments (stand-alone, guardband, inband), but in a single band, and with a frequency separation that is less than 20MHz.

P3

- Nokia wonders what is the consequence of this proposal. Ericsson think that it means that we can send less configuration information to the UE.
- Intel think that PCI can be different, at least acc to RAN1 assumptions. We should stick to R1 assumptions.
- ZTE and Ericsson think we should assume the same PCI.

P6

- Ericsson clarifies that if this is not set, then subframe availability need to be signalled. Ericsson explains that a non-anchor carrier can be an anchor carrier for other.

P78

- Ericsson think broadcast signalling is more efficient. Neul think it is the opposite. QC agrees. Nokia think that dedicated signalling is needed

- ⇒ **Carrier-ConfigDedicated-NB-r13 with the preceding ASN.1 format is introduced in physicalConfigDedicated-NB to specify the UL and/or DL non-anchor carrier(s) structure.**

- ⇒ We assume that the PCI of a non-anchor NB-IoT carrier can be different than its associated anchor carrier, but make this optional, and if not present PIC is the same as for anchor carrier. (can discuss later if to remove this optionality)
- ⇒ In case the parameter “servesAsAnAnchorForOthers” is set to “true” in the configuration to non-anchor carrier above for UL and/or DL, the UE shall assume the same available subframes as in its anchor carrier, as determined by PSS/PSS, MIB SIB1 and other SI messages and the signalled available subframes bitmap.
- ⇒ In case the parameter “servesAsAnAnchorForOthers” is set to “false” in the configuration to non-anchor carrier above for UL and/or DL, the UE assumes that only the bitmap of available subframes for the anchor carrier is applied also to the non-anchor carrier.
- ⇒ We only use dedicated signalling
- ⇒ P2 we postpone (we wait for R4 LS).
- ⇒ Except for diverging points above we endorse the provided ASN.1 proposal as a baseline.

R2-162639 NB-IoT – Further details on RA procedure for supporting multiple PRBs Nokia, Alcatel-Lucent Shanghai Bell discussion

- Ericsson think that this is covered by previous agreements.
  - Intel and Nokia clarifies that this is for the case when the UE is already in connected and performs a scheduling request.
    - o ALT1: for SR, the UE goes back to the anchor, after the RACH, the UE stays on the anchor unless explicitly redirected again
    - o ALT2: for SR, the UE goes back to the anchor, after the RACH, the UE goes back to the non-anchor PRB where he was before the RACH
  - Ericsson assumes ALT1, and think this is what we already agreed.
  - Intel think that the USS configuration of the anchor may have been lost such that ALT1 doesn't work. Ericsson think that the USS configuration is the same in the anchor and non-anchor PRB,
- ⇒ We stay with ALT1: for SR, the UE goes back to the anchor, after the RACH, the UE stays on the anchor unless explicitly redirected again

*Moved to 7.14.2.1 from 7.14.3.1*

R2-162658 Issues Related to Non- anchor PRB SHARP Corporation discussion

- Already covered
- ⇒ **noted**

## **Access Control**

R2-162948 Email Report of [93#42][NB-IOT] Access Control LG Electronics Inc. report late

- ⇒ We send LS to CT1 to inform about latest updates.
- ⇒ We confirm that NB-IOT access barring is specified separately from LTE access control mechanisms.
- ⇒ Access Barring and EAB use the same field descriptions as a baseline.
- ⇒ SIB14b-nb includes a separate flag indicating whether ab-BarringBitmap is applied to MO exception data (size 1), ab-BarringBitmap (size 10) for AC 0 to 9, and BarringForSpecialAC flags (size 5) for AC 11 to 15, and AB-category (2 bits).

- ⇒ All parameters above appear both in common and per-PLMN signalling, and the common signalled IEs are applied when the corresponding per-PLMN IE is not present.
- ⇒ RAN2 assumes that emergency access is not supported in NB-IOT.
- ⇒ RRC informs NAS about the failure to establish the RRC connection and that access barring is applicable.
- ⇒ RRC does not inform NAS about barring alleviation.
- ⇒ Both RRC Connection Establishment and RESUME is subject to Access Barring.

- R2-163051 Draft LS in R2-163051 (LG)  
Draft LS latest updates about access control for NB-IOT in RAN2 LGE LSout
- Huawei think that the first bullet is not needed as it is a RAN2 internal aspect. Ericsson agrees
  - Intel think we need more information in the LS for SA1.
- ⇒ Remove the first bullet
  - ⇒ Change “failure to establish” to “failure to establish or resume”
  - ⇒ Remove SA1. We send an LS to SA1 at a later stage.
  - ⇒ With these changes the LS is approved. Final version in R2-163122
- R2-162950 Proposed CR to 36.331 on NB-IOT access control LG Electronics Inc. draftCR 36.331 13.1.0 - -  
B Rel-13 NB\_IOT-Core  
late

Not treated

- R2-162681 Access Barring Ericsson discussion
- Only proposal 1 remains
- DT think this makes sense for non-NB-IoT but not for NB-IoT. Docomo think that this makes sense in a network where both UP and CP solution is deployed. Vodafone think that this need more thought.
  - Intel think that the concern is CN congestion, and in this case this can be handled by different means.
- ⇒ postpone
- R2-162682 Access Barring Ericsson draftCR 36.331 13.1.0 - - B Rel-13 NB\_IOT-Core
- R2-162937 Access Barring Alleviation for NB-IOT LG Electronics Inc. discussion

### Radio Link Failure and Supervision Timers

Huawei proposes to send a LS to CT1 to indicate that they might need to update their timers.

- Chair proposes that we wait until we know more

☒ **Email discussion on timers, and potential impact to NAS timers (Huawei)**

- R2-162323 Radio Link Failure Huawei, HiSilicon, Neuldiscussion
- R2-162313 Discussion on the Impacts of AS Timers Extension Huawei, HiSilicon, Neuldiscussion

### RRC Connection Release

- R2-162828 RRC Connection Release for CP solution Sequans Communications discussion

R2-162829 Autonomous RRC Connection Release Sequans Communications discussion

#### Other

R2-162880 NB-IOT – Remaining RRC Issues MediaTek Inc. discussion

*Above 7 docs not treated*

### 7.14.2.2 System Information

#### SI scheduling and SI update

R2-162770 System Information Update for NB-IoT Ericsson discussion

P2:

- Huawei think that there is no concept of modification period for MIB. Huawei think that the ab-enabled indication anyway need to be read from the MIB before Access.
- LG don't think that flexible modification period for MIB is needed. LG would prefer the LTE handling.
- Qualcomm think that even if the ab-flag changes it doesnot mean that SIB1 AB info need to be re-read.
- Chair wonders on which occasions the UE can avoid reading of MIB due to this proposal.
- DT think we don't need this proposal.
- Huawei still think that UE need to read the MIB to check the ab-flag, so the benefits are not clear
- Chair: No consensus.

P3

- LG wonders what happens to the SI scheduling info. Can't that change before change of other SI. LG think we can have a fixed period.
- Ericsson want to have a minimum modification period, for MIB, SIB1, SI-messages.
- Intel think that SIB1 modification period information need to be in MIB. Ericsson think that the minimum period 40.96s can be used for L1 accumulation.
- Neul dosen't think we need a modification period for SIB1, but the UE can just read upon notification. Neul wonders what is the benefit of this.
- Chair wonders how long BCCH modifcaion period we will have. 2 min 5 min 10 min, 30 min ?
- Huawei think that when AB is enabled the 40.96s period is applicable to AB SIB from UE point of view.
- Gemalto think that the benefit is limited as the UEs are most often asleep. LG agrees with Gemalto. Qualcomm agrees. DT agrees.

P4

- Gemalto think that the specific value tags need to be fixed.
- Neul wonders if the SI specific value tags apply to SIB14 and SIB16. Intel think we could just keep the definitions.
- Intel think that SIB16 time refers to the start of the relevant si-window and that SIB16 modifciation doesn't follow the BCCH modification period.

P5

- Gemalto wonders what this means.
- Ericsson clarifies that the 24h validity time is intended

P6

- MTK wonders what is the difference between SI specific value tags and this bitmap.
- Ericsson think that the UE can skip reading some SI, e.g. MIB and SIB1.
- Intel think we discussed this for eMTC, and that this means that paging will be used to greater extent than was intended. The paging was only intended for critical information change.
- ZTE supports this proposal. Huawei agrees.
- Intel think this can only for UEs that are not in long eDRX where eDRX period > modification period.
- LG think this is duplicate information.
- Chair: There is some support, and there is some opposition. As the benefits of this enhancements are not completeley clear We don't pursue this in Rel-13.

P7

- The main part of this proposal is to move these thresholds to SIB1. Gemalto think there is no benefit of this proposal, and would like to keep it where it is. Huawei Agrees.
- Chair: P7 is not agreed.

⇒ **Confirm that the legacy view terminology “System Information” including MIB, SIB1 and SI messages is also applicable to NB-IoT.**

⇒ **The content of the SIB1 remains valid / unchanged throughout the 40.96s SIB1 “modification period” (FFS if we need to name this).**

⇒ **We confirm that the 2 LSBs of H-SFN is included in MIB**

⇒ **We confirm that the SI-specific value tags are fixed to 2 bits as in eMTC.**

⇒ **For SIB14 and SIB16 we apply the same handling as for eMTC for the corresponding SIBs there.**

⇒ **The validity of the SI-specific value tags is same as the validity for systemInfoValueTag in MIB.**

⇒ **Include this in LS to RAN1 (Huawei)**

R2-162325 System Information Scheduling and Update Huawei, HiSilicon, Neuldiscussion

P1/2

- Ericsson point out that P2 is wrong (should be 2560ms). P1 is ok.
- Intel think that for eMTC the boundaries when SIB1 may change, and that this is sufficient. We don't need the 2560ms periodidity .. Intel think that we can phrase the TS text as for eMTC.
- Work offline on the TS text.

P3

- Intel think we cannot specify numbers unless we have more R1 information. Ericsson think that we can set the values when we know how large the SI information is.
- MTK think that RAN1 has some progress already. Intel think we don't know NB-PDSCH repetition numbers.
- Huawei think we received the information already from RAN1.
- Chairs opinion is that we don't expect much further information from RAN1, and it should be possible for us to make sufficient assumptions on the SIB sizes already.

P4:

- Intel wonders why we keep the lower values in the range. The max SI-window value should be compatible with the lowest value of the periodicity.
- Huawei think this is needed.

P5:

- Ericsson wonders if the assumption is that we never have more than 4 SI messages. Huawei confirms.
- Ericsson think we can have larger values.

P6:

- Huawei confirms that “required” is intended to mean the SI information that the UE need to obtain .. and that this shall not be confused with “essential” SI.
- Ericsson think that cell reselection information can be excluded from “required SI” when the UE is in good coverage, i.e. above the SXsearch thresholds.
- Neul wonders why we need to make this different to LTE.

⇒ **The value range of si-Periodicity for NB-IoT should be extended due to reduced bandwidth by considering the extension of SI-window value range.**

⇒ **the maximum range of BCCH modification period can be set up to FFS s, and the coefficient parameter range is set accordingly (offline).**

⇒ **The system information change indication (1bit for Systeminfomodification and 1bit for systemInfoModification-eDRX) carried in DCI is supported.**

⇒ **UE can monitor notification about system information update through physical layer control channels, as specified in TS 36.211 if there is no paging record after**

**PDCCH. Otherwise, the systemInfoModification and systemInfoModification-eDRX can be obtained by paging reception.**

⇒ **Clarify that the MIB, SIB1, and SIB2 to SIB5 are considered “required SI”.**

R2-163052 Way forward on SI scheduling in NB-IoT Huawei, Hisilicon, Neul Ltd., Intel

⇒ **The value range of si-WindowLength for NB-IoT is ENUMERATED {ms160, ms320, ms640, ms960, ms1280, ms1600, spare}.**

⇒ **The value range of si-Periodicity for NB-IoT is ENUMERATED {rf256, rf512, rf1024, rf2048, rf4096, rf8192, rf16384}.**

⇒ **As a baseline, the maximum value range of BCCH modification period can be set up to 1310.72s The Value is assumed to be defined as Paging Cycle \* Coefficient**

R2-162358 Considerations on system information change notification ZTE discussion

⇒ **noted**

### **SIB contents**

R2-162326 System Information Content Huawei, HiSilicon, Neul discussion, revised in

R2-162973 System Information Content Huawei, HiSilicon, Neul discussion

P1 already covered

P2

- Ericsson agrees to the largest value, but want that we have a better understanding on the SIB contents before we agree to the other values.
- Neul think that for most SIBs we have a good understanding on the size already, in SIB2 we expect the L1 configuration which may change.

P3

- MTK suggest to discuss this offline. Ericsson agrees, and think that the numbers are inconsistent with the proposal on si-Window.
- Huawei think that these values are for the repetition pattern

Include in offline

- P1: It is FFS which four of {208, 256, 328, 440, 552, 680} are the appropriate values selected for TBS of NB-SIB1 and other SIBs.
- P2: The Number of repetitions are 4, 8, 16. The time interval(s) between repetitions are 1, 2, 4, 8.

P1:

- Ericsson wonders why RAN1 chose 208 as the smallest value. E.g. for SIB14 this value is quite large. Intel think we can change in R1

P2

- Intel wonders if this is intended to be the same as for eMTC. In that case the proposal is not correct. Huawei think that this is correct.

⇒ **The TBS of NB-SIB1 and other SIBs are {208, FFS, FFS, 680}. We will reconsider the FFS-marked values when SI contents has been settled**

⇒ **The repetition is the same as for eMTC (number of repetitions, timer interval between repetitions).**

### **MIB contents**

R2-162724 NB-IoT Master Information Block content QUALCOMM UK INCORPORATED discussion revised

R2-162966 NB-IoT Master Information Block content QUALCOMM UK INCORPORATED discussion

P2

- Ericsson and Huawei think we don't need a FDD-TDD field in the MIB.
- Qualcomm think a mechanism is needed to prevent Rel-13 UEs from using a TDD cell.
- Chair think that we might need a mechanism for forward compatibility, but it doesn't need to be in MIB

P3

- Neul think this is only required in a very specific scenario
- We discuss the L1 parameters as part of later discussions.

⇒ **SIB1 scheduling information field in the MIB is an index to the scheduling information defined in the specification**

⇒ **SIB1 scheduling information index is 4-bits.**

⇒ **It is FFS if we introduce a mechanism to prevent that rel-13 UE shall treat this cell as not suitable to camp, e.g. for introduction of TDD, or other possibly incompatible features. If introduced it is not in the MIB.**

R2-162771 MIB Contents for NB-IoT Ericsson discussion

- We discuss the L1 parameters as part of later discussions.
- ⇒ Noted

### 7.14.2.3 Idle mode procedures

*Including output of email discussion [93#44][NB-IOT] Cell reselection and load distribution (Ericsson)*

#### 36.304

R2-162646 36.304 running CR to capture agreements on NB-IoT Nokia draftCR 36.304 13.1.0 - - B  
Rel-13 NB\_IOT-Core

- MTK think there are lots of FFSes. Nokia think that most of the FFSes can be resolved during this meeting.
- ⇒ **Endorsed as baseline for further work**

#### Mobility

R2-162687 Summary of email discussion [93#44] [NB-IOT] Cell reselection and load Ericsson discussion

- Chair think that the agreement means that NB-IoT in this release mainly support a homogenous network deployment.
- ⇒ **Based on the company feedback no further enhancement for load balancing as discussed in this contribution are pursued in REL-13.**

R2-162555 Load balancing in NB-IOT Intel Corporation discussion

⇒ **RAN 2 confirms that redirection information can be provided in RRC Connection Release message for both release and suspend.**

R2-162202 Mobility considerations for NB-IoT Gemalto N.V. discussion

- Contents covered by the email discussion agreement
- ⇒ **noted**

R2-162329 Report of the Email Discussion on Idle Mode Mobility and Paging Huawei discussion  
late

P1

- MTK think that applicability of RSRQ can be decided in R2.

- Ericsson think we should send a LS to RAN4 and say that RAN2 sees the benefit of RSRQ.
- Nokia think that from specification or network point of view having RSRQ is not a big overhead.

P3

- Ericsson think that RAN4 will do this anyway.
- Huawei think that we need input to our ASN.1.

P5

- Ericsson think that we need different Treselection for inter and intrafreq resselection.

P6

- Nokia wonders how this can be implemented in the specification. Qualcomm think that the LTE statement in the TS is better, because the UE would anyway just search for RATs that he is capable of.

P8

- Ericsson proposes an update to this at this meeting.
- Discussed later based on Ericsson tdoc.

- ⇒ **We assume that we use RSRQ to determine suitability, send LS to RAN4 asking to confirm this assumption.**
- ⇒ **E-UTRA inter-frequency redistribution is not applied in NB-IoT.**
- ⇒ **Ask also RAN4 to finalize parameter ranges that are under RAN4 responsibility needed for ASN.1.**
- ⇒ **Ask RAN4 on for guidance on parameters used to calculate Pcompensation**
- ⇒ **Treselection is supported. Two parameters are supported, one for interfrequency cell reselection and one for intrafrequency cell reselection. The value range is FFS.**
- ⇒ **In NB-IoT the UE is not required to search on other RATs during cell select.**
- ⇒ **A NB-IoT UE should always try to find a suitable cell. We assume that no standardized means are needed to limit power consumption, e.g. when no suitable cell can be found, but rely on UE implementation (We think this is already sufficiently reflected in the running CR).**
- ⇒ **TeDRX with 512 hyper-frames is supported.**

R2-162684 Idle mode mobility Ericsson discussion

P4

- Neul think that we don't need to apply RSRQ for the Sxsearch thresholds.

P5

- Ericsson explains that the criterion for when to apply the offset is still specified, only two parameters are left for UE implementation.
- Nokia prefer to keep this configurable as today but could consider changing the value ranges.
- Neul think that the timer value for NB-IoT is not so applicable as the DRX times are very long.
- Gemalto also supports the Ericsson proposal. DT would also accept this proposal rather than discuss changes to the original LTE solution.
- There is some support for this proposal.

P9

- Neul wonders how the duplex distance could be specified with this. What is the range of the offset etc.
- Ericsson clarifies that the intention is that the offset is from the center freq of an EARFCN.
- Ericsson indicates that the bands will follow a new spec for NB-IoT (not reuse LTE).

- ⇒ **In NB-IoT the selection criteria S is fulfilled when both  $S_{rxlev} > 0$  AND  $S_{qual} > 0$ .**
- ⇒ **In NB-IoT  $S_{qual}$  is defined as  $Q_{qualmeas} - Q_{qualmin} - Q_{offsettemp}$ .**
- ⇒ **NB-IoT do not support RSRQ based measurement threshold  $S_{intraSearchQ}$ ,  $S_{nonIntraSearchQ}$  (only RSRP based thresholds).**

- ⇒ **Qoffsettemp is supported in NB-IoT, but only the offset is broadcasted, i.e. counter and timer are left to UE implementation.**
- ⇒ **We assume that Pcompensation is used in the cell selection criteria  $S: S_{rxlev} = Q_{rxlevmeas} - Q_{rxlevmin} - P_{compensation} - Q_{offsettemp}$ . (params check with R4)**
- ⇒ **We assume that NB-IoT supports additionalSpectrumEmission and additionalPmax per band (8 bands), and we assume this is mandatory for the UE. (check the params with R4)**
- ⇒ **The measurement thresholds are mandatory present in system information.**
- ⇒ **It is FFS if a NB-IoT carrier is identified by <EARFCN, offset> (check R4)**
- ⇒ **In NB-IoT T-Reselection is broadcasted in SIB3 for intra-frequency and SIB5 for all inter-frequencies (i.e. common value for all inter-frequencies)**

R2-162328 Idle Mode MobilityHuawei, HiSilicon, Neuldiscussion

P7 remains

- Ericsson think that we need input from RAN4 in order to set the max range.
  - Huawei think that this value is not related to RAN4.
  - QC think that test cases exists.
  - Chair think this depends on whether the UEs are moving fast or not.
  - Intel point out that for eMTC we reused the LTE range.
  - Intel think that on Tselection RAN4 have already updated their specification, and think that no LS is needed (to CHECK)
- ⇒ **FFS if we on the range of Tselection need to ask R4**

DRAFT LS to RAN4 in R2-163042 (Huawei)

R2-163042 Draft LS on RAN2 needs from RAN4 on NB-IoT Huawei

- Title should be LS on NB-IoT RRM Requirements
- ⇒ **With this change the LS is approved in R2-163046**

## **IFRI**

R2-162327 Handling of IFRI for NB-IoT Huawei, HiSilicon, Neuldiscussion

P1

- Vodafone agrees that the 300s should be increased, but would prefer to use a configurable value. 6h may be problematic. Ericsson think that the 300s is a guideline.
- Chair think that for long eDRX the UE would anyway not attempt measurements and reslection again until he wakes up, and for a UE that is not configured with eDRX maybe this is not a problem.
- Intel has sympathy for this proposal, but this is complex to converge.
- Ericsson thinks that 6h is too long time, and the time should depend on the reason for barring.
- Chair: Difficult to converge on this quickly, suggest to not pursue this in Rel-13.
- Hauwei think that an alternative is to consider the 300s as a minimum, and leave the actual "barring time" up to UE implementation. Vodafone think that an operator would like some way to ensure that UE comes back to a cell when unbarred.
- Chair: Suggest not to pursue.

P2

- Neul think this is cell selection so there is no problem . Gemalto think that there are other mechanisms to prevent excessive measurements but don't see that it would be needed here.
- Could discuss offline

P3

- Could discuss offline
- ⇒ Noted

## Measurements

- R2-162869 Measurement Rules for Cell Reselection for NB-IoT LG Electronics France discussion
- Ericsson think that this is already agreed. What need to be clarified?
  - Neul wonders how many frequencies we are assumed to measure? Ericsson indicates that there are ongoing discussions in RAN4.
- ⇒ **Confirm that UE should apply inter-frequency measurement rules only for the listed inter-frequencies indicated in system information.**
- ⇒ **Can discuss offline whether change is needed to make this clear.**
- R2-162201 Measurement considerations for NB-IoT Gemalto N.V. discussion
- MTK think this is either R4 responsibility or can be done with UE implementation.
  - Intel has sympathy for this proposal, and think this is not a R4 issue.
  - Sierra wireless support this in principle.
  - Ericsson sympathetically disagrees, i.e. think that the problem may be relevant, but are not sure that the solution would work. Ericsson think that we should not work on this. Ericsson think that the proposal is not clear.
  - Chair wonders why this should be controlled by SI? Gemalto think that it is used to disable/enable the UE impl behaviour.
  - There is significant support, but the proposal is not completely clear, and there are concerns,
  - DT and chair suggest that we don't pursue this in Rel-13. QC and Huawei agrees
- ⇒ **Noted**

## Other

- R2-162882 NB-IOT – Remaining Issues on Idle-mode Procedures and Paging MediaTek Inc. discussion
- ⇒ **noted**
- R2-162919 Discussion on remaining idle mode issues in NB-IoT Samsung Electronics discussion
- ⇒ **noted**

## 7.14.2.4 Paging

- R2-162686 Paging and (e)DRX Ericsson discussion
- P2
- Chair indicated that we have already agreed that this is a single fixed value and that we would select between 2.56 or 5.12. Nokia agrees.
  - Intel think that we should assume even longer cycle, 10.24s. Intel think this could be useful for the worst coverage, and would ensure that we have multiple paging groups)
  - Huawei think that 2.56 is not sufficient for worst coverage and proposes 5.12s. LG agrees.
  - ZTE would not like to select a value now.
  - Huawei think that if Intel can justify the longer value it could be considered.
- P3
- QC think that some of the lower values may not be applicable, depending on the DRX cycle(s) for the short DRX
  - Intel think that CT1 has already specified the values. Ericsson think that CT1 expects R2 confirmation.
- 
- P4
- QC think this depends on the DRX value(s)
- P6
- MTK indicates support.
  - ZTE wonders why this wasn't done for eMTC. CATT think that we didn't see the need for the distribution.
  - Intel think that we need more discussion in order to diverge from eMTC. Intel suggest that this is discussed in the email discussion on eDRX.

- We don't pursue this in rel-13.

After initial discussion (further progress below)

- ⇒ **The eDRX cycle length value range in NB-IoT is {5.12 (FFS), 10.24 (FFS), 20.48, 40.96, 81.92, 163.84, 327.68, 655.36, 1310.72, 2621.44, 5242.88, 10485.76} sec.**
- ⇒ **It is FFS exactly which PTW size values are applied, depending on a eDRX email discussion. We will decide at the ad-hoc.**
- ⇒ **In NB-IoT there is no eDRXAllowed indicator in system information.**
- ⇒ **We confirm that the same loose H-SFN synchronization as in eMTC is used in NB-IoT.**

R2 Confirms next 2 agreements (may be duplicated)

- ⇒ **Two “direct indication” bits are used for SI update, for cases when SI change notification is done without paging.**
- ⇒ **The two SI update indications are included in the RRC Paging message when there is normal paging (one or more paging records in the Paging message) and SI change notification at the same time.**
- ⇒ **In NB-IoT the maximum number of Paging Records in the Paging message is 16.**
- ⇒ **Include nb-mpdcch-NumRepetitions-Paging IE in RadioResourceConfigCommonSIB in SIB2.**

Offline: How to progress to decide Idle mode DRX cycle value(s). (Ericsson).

R2-163053 Way forward on DRX, eDRX and PTW value ranges for NB-IoT Ericsson, Vodafone, ZTE, Docomo, Huawei

- Neul wonders if MME need to know the cell specific DRX. Ericsson think that this is the case.
- Chair think that this is a broadcasted value, i.e. with no NAS involvement.
- Qualcomm wonders if PTW need to be longer to allow for more paging occasions.
- Intel think that CT1 may want to revisit the PTW value range.
- ⇒ **NB-IoT supports a Cell specific DRX cycle that is configurable and broadcasted, Range {1.28, 2.56, 5.12, 10.24} sec**
- ⇒ **eDRX cycle, NB-IoT supports {20.48, 40.96, 81.92, 163.84, 327.68, 655.36, 1310.72, 2621.44, 5242.88, 10485.76} sec.**
- ⇒ **PTW: Working assumption: {0, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5, 25, 27.5, 30, 32.5, 35, 37.5, 40} sec.**

R2-162330 Remaining Open Issues on Paging in NB-IoT Huawei, HiSilicon, Neul discussion

- Already covered
- ⇒ **noted**

R2-162359 Remaining issues for Paging in NB-IoT ZTE discussion

- ZTE point out that we may have very limited resources for paging, e.g. we may have zero POs in a PF.
- MTK think we can use next SF when a SF is not available as specified by R1. Huawei agrees in principle and don't see any motivation to change. Ericsson agrees.
- ZTE wonders if we always assume that one paging PF has one paging PO? ZTE thinks yes and that this need to be taken care of.

- Ericsson think that there will always be a PO associated with a calculated PF, but it may occur in the next frame.
- ZTE wonders if we need to update our specification.

P3

- Ericsson, LG and Huawei think we can use the existing table

⇒ **We update 36.304 such that the R1-agreed solution to handle non-available paging SFs can be clearly understood, either by description or by reference.**

⇒ **In NB-IoT, we use the legacy LTE PO-table, as proposed in LS from RAN1.**

LS to CT1 and RAN3 on DRX agreements (Ericsson), Draft in R2-163127

Comeback friday

### 7.14.3 User Plane

#### 7.14.3.1 MAC/RLC

##### General

R2-162778 36.321 running CR to capture agreements on NB-IoT Ericsson draftCR 36.321 13.1.0 - - B  
Rel-13 NB\_IOT-Core  
late

- Ericsson indicates that the section 7.7 in the last page is new compared to previous version and is a proposal.

⇒ **Endorsed as baseline.**

R2-162777 Email discussion report on MAC open issues for NB-IoT Ericsson discussion  
late

P1 discussed based on other contribution

P2

- Nokia think that RP agreed on 80bits for MSG3 and it is not clear that this will fit.
- ZTE think that there may be more bits, e.g. optionality, that need to be signalled so the overhead would be minimal
- Vodafone supports to introduce these bits in MAC
- LG think BSR and DVI are different, and there is no reason to have these in both layers.
- Qualcomm think that we should have all the bits either in RRC or in MAC.

P4

- LG wonder if we would specify LCIDs for NB-IoT separately or not. Ericsson think we can decide that later when making the CR text.
- LG think that we can reuse the LTE LCIDs even if they are not used. LG see no reason to have a specific NB-IoT table.
- MTK think that we anyway need to specify which LCID values are not applicable and see no problem in having another table.
- Docomo think this doesn't need to be documented in MAC but can be deduced based on supported / non-supported functionality for NB-IoT. LG think we anyway should document this in MAC.
- Huawei think we need to be clear, and think that we need specific LCID space for NB-IoT.

P5

- ZTE think we might need a second CCCH indication for the resume request message, depending on how we structure RRC.
- Nokia think we need to normal BSR, for the solution 18, for long transmissions. Ericsson wonders why. Nokia think this is needed for long transmissions. Ericsson think we can always include the 4bit DVI in all UL transmissions. Nokia think that DVI is only for MSG3.

Ericsson think that we replance BSR by DVI for NB-IoT. Huawei agrees with Ericsson. CATT think that if we have the DVI in RRC we cannot have it except for MSG3. Intel agrees with Nokia. DT would like to have only one solution, i.e. to put DVI in MAC. MTK support nokia and Intel. LG think we already agreed that BSR is applicable to NB-IoT.

- Ericsson think that the agreement was that we shall have a common solution. Huawei think that we agreed on a BSR-like-mechanism. Nokia think that the legacy mechanism for BSR works fine.
- ZTE think that we never discussed the details of the fullblown BSR.

P6

- Ericsson and Intel think that we reuse the size of LTE.

DVI/BSR

- Vodafone and DT think we don't need the legacy BSR and we can used the DVI in a general way.
- LG think we should not have DVI in MAC. LG think we should separate DVI and BSR.
- Intel think that if we have multiple DRBs we might need the current fullblown BSR mechanism. Intel also think that we need to consider the size limitation.
- Ericsson think that the total data volume in DVI is sufficient, which is very simple. Huawei agrees.
- ZTE think we might need to spend more time in discussin this. ZTE would anyway like to not have the full-blown BSR.
- Nokia wonders whether we assume all data for DVI, both DRB and SRB?
- LG think a new mechanism is complex and we would need to discuss triggering etc.

P7/8

- Gemalto wonders what does associated feedback mean. Ericsson exmaplin that this is the HARQ acknack feedback for the transmission. Gemalto would be ok with these proposals.
- LG think that we have separate HARQ processes for UL and DL and DL and UL transmissions do not need to block each other.
- Ericsson think that RAN1 is introducing gaps and that the UE shall not be required to monitor NPDCCH during these gaps. MTK confirms that there are gaps but think this is a different aspect. MTK are not sure what is the sceario when we need interleaving between DL and UL.
- Huawei confirms that there are gaps.
- Intel think that P78 reduces the UE complexoty and supports.
- LG think there is no complexity related to have UL/DL interleaving because we assume separate HARQ processes. Ericsson think the consequence is power consumption because the UE has to monitor NPDCCH more.
- Docomo also think that these rules are not needed. NEC agrees.
- Neul think these proposals may bring complexity benefits in executing PDCCH operations one at a time rather than in parallel.
- Chair: we don't pursue P7/8 in Rel-13.

P9

- LG think we shouldn't discuss this as it has been discussed earlier. Nokia agrees and think this is an optimization. LG think that the impact of this change is large.
- Huawei support the Ericsson proposal. MTK support. Telecom Italia suggest that we agree with the proposal.
- LG are not happy about this but can accept the proposal.

- ⇒ **If we introduce new IEs in MAC for MSG3, the overheehead is expected to be the remaining bits in an octet.**
- ⇒ **The following five DL LCIDs are applicable for NB-IoT: "CCCH", "Identity of the logical channel", "UE Contention Resolution Identity", "Timing Advance Command", "Padding" and RAN2 to select one of either "DRX Command" or "Long DRX Command".**
- ⇒ **(at least) the following four UL LCIDs are applicable for NB-IoT: "CCCH", "Identity of the logical channel", "C-RNTI", and "Padding".**
- ⇒ **It shall be clear in 36.321 which LCIDs are applicable and not applicable to NB-IoT.**
- ⇒ **We confirm that we reuse the LCID size of LTE**
- ⇒ **The drx-InactivityTimer should be started at the end of the transmission/re-transmission of each MAC PDU.**

- ⇒ **The “UL HARQ RTT Timer” is constant and started on the last subframe of the NPUSCH transmission and the “HARQ RTT Timer” is variable and started on the last subframe of the NPDSCH transmission.**

We invite for offline discussion and way forward on DVI/BSR (including support for long transmissions, i.e. not only in MSG3) Ericsson.

**Offline Discussion:**

Ericsson presented a potential solution for DVI/PHR replacing current functionality.

- After discussion and explanations 5 companies indicated that they would not like to use the described potential solution and 7 companies indicated support.
- Chair suggest a way forward where we use DVI only for MSG3, and use LTE BSR/PHR for non-MSG3 cases.
- Vodafone think we still need to discuss which parts of the LTE BSR/PHR are applicable / not applicable to NB-IoT.
- ZTE proposes a compromise to go with this way forward but to allocate DVI/PHR to the MAC layer, to keep similar functions in one layer.
- Nokia think that if we include this in MAC we will have a non-necessary difference between NB-IoT and non-NB-IoT as it can anyway not be in MAC for LTE. CATT agrees.
- Huawei think that the proposed way forward doesn't save time. Ericsson agrees.
- Docomo and LG support the way forward.
- DT think that we don't need to coordinate with LTE. Vodafone agrees.
- Huawei doesn't want to support all of current BSR functions.
- Chair think that for NB-IoT we can assume only one LC group. Vodafone agrees.
- Docomo think that there is a preference to have this in MAC as otherwise the RRC message may need to be built in the fly.
- Ericsson also think that having scheduling information in RRC makes things complex in the network.
- Huawei think that PHR is not needed after the MSG3. Ericsson think that PHR is useful also after MSG3, in cases when connections are “long”.
- Huawei clarifies that RAN1 only asked to include PHR in MSG3.

- ⇒ **We use NB-IoT specific DVI/PHR for MSG3, and use LTE BSR for non-MSG3 cases.**
- ⇒ **We don't include PHR for other cases than MSG3 as RAN1 hasn't asked for it.**
- ⇒ **For NB-IoT we consider a subset of LTE BSR support, the subset is FFS.**
- ⇒ **We put the NB-IoT-specific DVI/PHR functionality in MAC**

Draft LS in R2-163043 (Huawei). We point out the above on PHR, so that RAN1 can take it into account and ask whether we need PHR for other cases than MSG3.

- R2-163043 Draft LS on Power Headroom report Huawei  
Reviewed on-line.
- ⇒ **On-Line edition approved in R2-163045**

- R2-163050 Offline discussion on exactly which subset of LTE BSR is applicable to NB-IoT (Mediatek).  
Way Forward on Supported Subset of BSR for NB-IOT Mediatek Inc  
P1
- Nokia wonders if this is for MSG 3 or also for other cases. Mediatek explains that this is for after MSG3. Nokia think that PHR after MSG3 is not needed in Rel-13. Ericsson explains that it is needed for long transmissions
  - We wait for LS, discuss P1 later ..
- P2

Proposal 1:PHR (2 bits) is always sent when BSR is sent. Introduce a MAC CE carrying BSR and PHR together

We didn't come back to this proposal. This is left FFS

- ⇒ Only a Short BSR is supported for NB-IOT (no long BSR).
- ⇒ Same text as for legacy LTE in 36.321 on BSR trigger new data and high priority data is used for NB-IOT.
- ⇒ all data belongs to the same priority for NB-IOT wrt BSR triggering.
- ⇒ BSR retransmission is supported for NB-IOT (We also support infinity value for reTxBSR-Timer)
- ⇒ Periodic BSR is supported for NB-IOT
- ⇒ Padding BSR is supported for NB-IOT
- ⇒ Reuse BSR cancellation mechanism, with the difference that a padding BSR can cancel a pending regular or periodic BSR (i.e. the NOTE about padding BSR and cancellation is not applicable for NB-IoT).
- ⇒ For NB-IoT all logical channels belong to one LCG that do not need to be configured by RRC. This LCG comprises both SRB and DRB.
- ⇒ Exact signalling format is FFS
- ⇒ Value ranges is FFS

### Scheduling and HARQ

R2-162773 Remaining issues on Scheduling and HARQ for NB-IoT Ericsson discussion

- Already covered
- ⇒ **noted**

R2-162335 HARQ Configuration Huawei, HiSilicon, Neuldiscussion

- ⇒ **maxHARQ-Tx and maxHARQ-Msg3Tx are not supported for NB-IoT as only asynchronous HARQ is supported, therefore they don't need to be configured in RRC.**

### Support for UL scheduling

R2-162640 SR procedure for NB-IoT Nokia, Alcatel-Lucent Shanghai Bell discussion

- Ericsson do not see a need for this. Huawei agrees. This seems only needed for D-SR.
- Ericsson acknowledges that there is the possibility for D-SR to be included in the HARQ feedback sent in the UL. Huawei think that this is NOT the case.

Offline checking of RAN1 status regarding D-SR (D-SR with HARQ feedback)  
We did not come back to this, It is still left FFS

### RACH

R2-162331 Random Access Procedure Huawei, HiSilicon, Neuldiscussion

- Huawei comments that the proposed ASN.1 need to be updated based on latest RAN1 agreements.
  - Intel would like to use the same formula as eMTC
- P1
- ZTE and Ericsson wonders if there is a R1 agreement on the max number of PRACH partitions? Huawei think that RAN1 has decided on 8 partitions.
  - Intel think that p1 is ok, Ericsson agrees and we can set the details later.
- P2, P3
- ZTE wonders what is PDCCH period? Huawei think this is the duration between two starting subframes for PDCCH of the same Coverage level.
  - Ericsson think that PDCCH period is a nice concept, and can be used extensively. PDCCH period avoids a lot of configuration. CATT also support this approach. ZTE are not

convinced. Ericsson point out that there are examples in the email discussion. Neul think this would simplify our work. Ericsson think that timers would not only be dependet on Coverage level but also deplyment and nu of available subframes etc ..

- ZTE wonders if we have a PDSCH periodicity that is different to PDCCH period?
- Chair wonders if the PDCCH period is the same all the time or if it varies.
- Intel wonders if we should apply PDCCH period also in eMTC. Ericsson think that for eMTC there is lots of legacy and have doubts. Neul think that NB-IoT timers and eMTC timers are different and think that if coordination ios done, eMTC need to follow NB-IoT.

P5

- Ericsson think it Would be good if we could align the names and support the contents of the table.
- Huawei clarifies that “pp” is PDCCH period. ZTE would like to check the numbers where “pp” is used, but supports the table otherwise.

P7

- Intel wonders if we really need to use PRACH period? Huawei think the range of the parameter can be smaller. ZTE think that if we use 4 bits we don't need to do it this way.

P8

- Ericsson wonder if the intention is to change MAC IE. HUawei think not. Except for this Ericsson support, and 960ms is too short. We need a new table anyway, Ericsson supports.

P9

- ZTE think this is still needed. Huawe think that the minimum PRACH period is 40ms and there is only one PRACH opportunity in this period. ZTE still think that we can start at different subframes.
- ZTE still think we need to know the subframe. We don't discriminate between coverage level.

P10

- ZTE don't think this is needed. Ericsson supports this.

P11

- ZTE think this isn't needed and that we don't need to consider RAR windows > 1 HSFN cycle.
- Ericsson support this.

⇒ **The multiplexing parameters including nb-prach-numSubcarrier, nb-prach-SubcarrierOffset, nb-prach-period, and nb-prach-StartingTime for PRACH resource for different coverage level and ST/MT can be broadcasted in system information for UE choosing PRACH resource according to its coverage level and msg3 ST/MT requirement.**

⇒ **We introduce the concept of PDCCH period.**

⇒ **It is FFS if the PDCCH period is the duration between two consecutive starting subframes for PDCCH of the same Coverage level. RAN1 definition might be used.**

Offline on what should be the definition of PDCCH period, We never came back on this. It is still left FFS

⇒ **Use PDCCH period instead of subframe as basic unit of ra-ResponseWindowSize.**

⇒ **Use PDCCH period instead of subframe as basic unit of mac-ContentionResolutionTimer.**

⇒ **preambleMappingInfoList is not needed in NB-IoT.**

⇒ **As a baseline, we assume that the parameters values and information need for RA initialization can be determined by the table below. We may need to revisit PP-values in the table.**

| Parameters              | LTE/eMTC                                 | NB-IoT                                              |
|-------------------------|------------------------------------------|-----------------------------------------------------|
| <i>powerRampingStep</i> | {dB0, dB2, dB4, dB6}                     | Designed by RAN4                                    |
| <i>preambleTransMax</i> | {3, 4, 5, 6, 7, 8, 10, 20, 50, 100, 200} | Re-use:<br>{3, 4, 5, 6, 7, 8, 10, 20, 50, 100, 200} |

|                                           |                                                                                                                                             |                                                                                                 |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <i>preambleInitialReceivedTargetPower</i> | {dBm-120, dBm-118, dBm-116, dBm-114, dBm-112, dBm-110, dBm-108, dBm-106, dBm-104, dBm-102, dBm-100, dBm-98, dBm-96, dBm-94, dBm-92, dBm-90} | Designed by RAN4                                                                                |
| DELTA_PREAMBLE                            | Defined in 36.321                                                                                                                           | Designed by RAN4                                                                                |
| <i>maxHARQ-Msg3Tx</i>                     | {1, 2, 3, 4, 5, 6, 7, 8}                                                                                                                    | Not support because of the asynchronou and adaptive UL HARQ process, as analyzed in [3]         |
| <i>preambleMappingInfoList</i>            | Designed by RAN1                                                                                                                            | Not support                                                                                     |
| <i>RSRP-ThresholdsPrachInfoList</i>       | Mapping to 36.133                                                                                                                           | Designed by RAN4                                                                                |
| <i>maxNumPreambleAttemptNPRACH</i>        | {3, 4, 5, 6, 7, 8, 10}                                                                                                                      | Re-use:<br>{3, 4, 5, 6, 7, 8, 10}                                                               |
| <i>nprach-NumRepetitions</i>              | {1, 2, 4, 8, 16, 32, 64, 128}                                                                                                               | RAN1 agreement:<br>{1, 2, 4, 8, 16, 32, 64, 128}                                                |
| <i>ra-ResponseWindowSize</i>              | LTE: sf {2, 3, 4, 5, 6, 7, 8, 10}<br>eMTC: sf {20, 50, 80, 120, 180, 240, 320, 400}                                                         | Using pp instead of sf directly, re-use the value in LTE:<br>pp {2, 3, 4, 5, 6, 7, 8, 10}       |
| <i>mac-ContentionResolutionTimer</i>      | LTE: sf {8, 16, 24, 32, 40, 48, 56, 64}<br>eMTC: sf {80, 100, 120, 160, 200, 240, 480, 960}                                                 | Using pp instead of sf directly, re-use the value in LTE:<br>pp {8, 16, 24, 32, 40, 48, 56, 64} |

- ⇒ It should be possible to have different backoff times for different coverage levels.
- ⇒ FFS if we Use PRACH period as basic unit for backoff. The backoff time can be caluculated as Backoff Parameter value \* PRACH period.
- ⇒ FFS if we Remove subframe index  $t_{id}$  from the calculation of RA-RNTI.

R2-162360 Further analysis on preamble transmission in NB-IoT ZTE discussion

⇒ **Noted**

- ☒ **RACH, Open issues from R2-162331 and R2-162360 on a) PRACH configuration including PDCCH Period b) Neccesary Updates to RA-RNTI formula and RAR contents, c) BI value definition/mapping (ZTE).**

R2-162617 Support of different Msg.3 TBS for NB-IoT UEs NTT DOCOMO, INC. discussion

- Already covered

⇒ **Noted**

R2-162774 Use of preambleTransMax for NB-IoT Ericsson discussion

- QC and Neul wonders why the UE should not just stop. QC think we can go for the simpler approach.
- Intel think that the ramping may not be finalized at the time when max TX occurs
- Ericsson think that if we stop then higher layers will retry.
- CATT think that the ramping need to be finalized before stop.

⇒ **MAC shall stop transmissions after reaching max no of transmissions on the worst coverage level.**

**DRX**

R2-162332 DRX in Connected Mode Huawei, HiSilicon, Neuldiscussion

P4

- QC think that when we are in connected mode, the UE should not switch to a different coverage level.
- Intel wonders about the configuration in connected mode. Huawei think that UE only has the configuration of one coverage level at the time. Huawei think that the UE can be reconfigured. QC is concerned that DRX timers may then vary.
- Ericsson supports this proposal.
- MTK think that we don't need this. We can adapt anyway to repetitions etc.
- Chair think that it is not clear which timers should change when UE changes coverage level, and in particular
- Intel think that the configuraion should not change when the UE changes coverage level.
- Ericsson think that DRX cycle could be configured in absolute terms.
- QC think that the inactivity timer is related to traffic model.
- Neul think that the DRX configuration would ensure that there would be a certain number of opportunities to reach the UE.
- ZTE think that we can achieve the same thing with other measne

P5

- Ericsson think we need some "0"-values, that has been forgotten in the LTE column
- Ericsson think we should have fewer values for the DRX start-offset.
- Nokia wonders why we need zero-values. Ericsson think that we might want to

Intel wonders what would be the max time

- Ericsson think that the max transmission time 2.56s
- 

- ⇒ **The onDurationTimer, drx-InactivityTimer, drx-RetransmissionTimer and the HARQ RTT timer in NB-IoT should be extended, compared to eMTC/LTE.**
- ⇒ **drx-ULRetransmissionTimer in eMTC should be re-used in NB-IoT because of the asynchronous and adaptive UL HARQ process. While the values should be extended.**
- ⇒ **We use PDCCH period instead of PDCCH subframe as basic unit of corresponding DRX parameters, except for the DRX cycle.**
- ⇒ **We use table below as baseline for value ranges, but aim to have fewer start-offset-values and fewer on-duration-values**

| Parameters                      | Analysis                                                                      | LTE (not updated)                                                                                                                                                                                                                             | NB-IoT                                                                                                                                                                                                                                                        |
|---------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>onDurationTimer</i>          | Using pp instead of psf directly                                              | psf {1, 2, 3, 4, 5, 6, 8, 10, 20, 30, 40, 50, 60, 80, 100, 200}                                                                                                                                                                               | pp {1, 2, 3, 4, 5, 6, 8, 10, 20, 30, 40, 50, 60, 80, 100, 200}                                                                                                                                                                                                |
| <i>drx-InactivityTimer</i>      | As analyzed in proposal 3 and using pp instead of psf. Remove some big values | psf {1, 2, 3, 4, 5, 6, 8, 10, 20, 30, 40, 50, 60, 80, 100, 200, 300, 500, 750, 1280, 1920, 2560}                                                                                                                                              | pp {0, 1, 2, 3, 4, 5, 6, 8, 10}                                                                                                                                                                                                                               |
| <i>drx-RetransmissionTimer</i>  | Using pp instead of psf directly                                              | psf {1, 2, 4, 6, 8, 16, 24, 33}                                                                                                                                                                                                               | pp {0, 1, 2, 4, 6, 8, 16, 24, 33}                                                                                                                                                                                                                             |
| HARQ RTT Timer                  | Re-use eMTC                                                                   | 8 subframes                                                                                                                                                                                                                                   | Re-use: 8 subframes                                                                                                                                                                                                                                           |
| <i>longDRX-CycleStartOffset</i> | Using pp instead of sf directly                                               | sf10INTEGER(0..9),<br>sf20INTEGER(0..19),<br>sf32INTEGER(0..31),<br>sf40INTEGER(0..39),<br>sf64INTEGER(0..63),<br>sf80INTEGER(0..79),<br>sf128 INTEGER(0..127),<br>sf160 INTEGER(0..159),<br>sf256 INTEGER(0..255),<br>sf320 INTEGER(0..319), | pp 10 INTEGER(0..9),<br>pp 20 INTEGER(0..19),<br>pp 32 INTEGER(0..31),<br>pp 40 INTEGER(0..39),<br>pp 64 INTEGER(0..63),<br>pp 80 INTEGER(0..79),<br>pp 128 INTEGER(0..127),<br>pp 160 INTEGER(0..159),<br>pp 256 INTEGER(0..255),<br>pp 320 INTEGER(0..319), |

|                                  |                                        |                                                                                                                                                                                                                    |                                                                                                                                                                                                                      |
|----------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  |                                        | sf512 INTEGER(0..511),<br>sf640 INTEGER(0..639),<br>sf1024 INTEGER(0..1023),<br>sf1280 INTEGER(0..1279),<br>sf2048 INTEGER(0..2047),<br>sf2560 INTEGER(0..2559),<br>sf5120 INTEGER(0..1),<br>sf10240 INTEGER(0..3) | pp 512 INTEGER(0..511),<br>pp 640 INTEGER(0..639),<br>pp1024 INTEGER(0..1023),<br>pp1280 INTEGER(0..1279),<br>pp2048 INTEGER(0..2047),<br>pp2560 INTEGER(0..2559),<br>pp5120 INTEGER(0..1),<br>pp10240 INTEGER(0..3) |
| <i>drx-ULRetransmissionTimer</i> | Same as <i>drx-RetransmissionTimer</i> | none                                                                                                                                                                                                               | pp {0, 1, 2, 4, 6, 8, 16, 24, 33}                                                                                                                                                                                    |
| UL HARQ RTT Timer                | Samilar to HARQ RTT Timer              | eMTC: 4 subframes                                                                                                                                                                                                  | 4 subframes                                                                                                                                                                                                          |

## RLC

R2-162614 Updated RLC running CR for NB-IoT NTT DOCOMO INC. draftCR 36.322 13.1.0 - - B  
Rel-13 NB\_IOT-Core

- Ericsson indicated that there is a paper on t-reordering. Neul also have views and a tdoc on t-reordering
- Ericsson think we need to change “data over NAS” as it is not entirely correct.
- Chair think this is for a UE with only SRB (i.e. no DRB)

⇒ **We should change “data over NAS” into something else FFS.**

Can discuss offline. We didn't come back during meeting on-line session

R2-162333 RLC Remaining Issues Huawei, HiSilicon, Neul discussion

P2

- Ericsson think that max SDU size is larger than 1500 octets. Overhead need to be included for e.g. Data over NAS, there is also ROHC overhead. Neul confirms this and confirms that the assumption is that IP packet Max PDU is 1500 octets.
- Vodafone and Qualcomm think that we need to first decide PDCP SDU size

P6

- Ericsson think that considering that the t-reordering set to zero is not a correct way.

P11

- Ericsson think lower values should be allowed. Docomo agrees and think the largest value is too large.

⇒ **RAN2 assumes 1500 octets max PDU size for application layer, both for IP and Non-IP, for UL and DL, both for CIOT CP optimization (NAS SDU) and UP optimizations (PDCP SDU).**

⇒ **We assume that the resulting limitation regarding PDCP SDU size will also be applicable to SRB.**

We send LS to SA2, CT1, CT4. DRAFT LS in R2-163055 (Qualcomm).

R2-163055 (draft) Maximum upper layer data packet size for NB-IoT Qualcomm LSout

⇒ **Approved. Final version in R2-163123**

✉ **t-reordering (docomo)**

⇒ **t-StatusProhibit is not supported. From RLC specification view we can consider this set to zero. The parameter is not needed in the RRC ASN.1 for NB-IoT.**

- ⇒ **The value range for t-PollRetransmit needs to be updated for a NB-IoT UE and is FFS. Values in the order fractions of a second to 180 seconds to account for transmission times, HARQ attempts and scheduling delays.**

R2-162775 The usage of t-Reordering for NB-IoT Ericsson discussion

- Covered
- ⇒ **noted**

R2-162334 RLC and PDCP Discard Huawei, HiSilicon, Neul discussion

- Ericsson think that discard timer is useful. Docomo also think so.
- Qualcomm also think that the UE should not attempt for too long time.
- MTK think that the discard timer is not useful in data communication case. Vodafone think we can leave it out.
- ⇒ **PDCP discard timer is used for NB-IoT**

R2-162547 Further discussion on RLC-AM for NB-IOT Intel Corporation discussion

- Neul thinks that 4kbyte is ok. QC agrees.
- ⇒ **4 kbytes is the layer 2 buffer size for NB-IOT.**

### 7.14.3.2 PDCP

R2-162732 Introduction of NB-IoT functionality to PDCP protocol Qualcomm Incorporated (Rapporteur)  
draftCR 36.323 13.1.0 - - B Rel-13 NB\_IOT-Core **R2-162074**

- Only update is the change of baseline
- ⇒ **Endorsed as baseline for further updates**

R2-162776 RoHC for NB-IoT Ericsson discussion

P1

- Neul would like to discuss to exclude more. Ericsson think we should keep TCP profiles.

P3

- Neul wonders which parameters that could be used to facilitate this.

- ⇒ **The RoHC profiles that exist in legacy LTE can be included also for NB-IoT except the RTP profile.**
- ⇒ **The RRC resume message should contain an indication on whether the UE shall continue with the old RoHC context/state or whether it shall reset/restart RoHC and send a full header.**
- ⇒ **In the DVI, if the UE can ROHC-compress the first packet, the UE should report the RoHC compressed UL volume in Msg3, which means that the UL volume is counted the same as in any other UL message.**

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## Wrap up

R2-163121 Way Forward on NB-IoT Vodafone, revised online to

- R2-163128 Way Forward on NB-IoT Vodafone,  
- MAC review should start asap, after the weekend.  
- Intel think that we should have email discussions after R2#94  
- Intel think we should have an issue list template.  
- Tdoc deadline for the adhoc Wed 27/4

⇒ **We endorse this plan**

## Approved LS out

- R2-163125 Reply LS on NB-IoT RAN2 LS out  
R2-163049 Reply LS on direct SI update indication for NB-IoT RAN2 LSout  
R2-162047 Reply LS on per-UE configuration to allow exception reporting RAN2 LSout  
R2-163048 Reply LS on per-UE configuration to allow exception reporting RAN2 LSout  
R2-163044 Draft Reply LS on Existence of CIoT support and NAS protocol details for CIoT RAN2 LSout  
R2-163122 LS latest updates about access control for NB-IOT in RAN2 RAN2 LSout  
R2-163046 LS on NB-IoT RRM Requirements RAN2 LSout  
R2-163045 LS on Power Headroom report RAN2 LSout  
R2-163123 Maximum upper layer data packet size for NB-IoT RAN2 LSout

## Agreed email Discussions

- ☒ **RACH, Open issues from R2-162331 and R2-162360 on a) PRACH configuration including PDCCH Period b) Necessary Updates to RA-RNTI formula and RAR contents, c) BI value definition/mapping (ZTE).**
- ☒ **Email discussion on t-reordering, on how to achieve the desired RLC behaviour (docomo)**

Email discussion on timers, and potential impact to NAS timers (Huawei)

## Comeback Friday

- R2-163041 Draft LS on Security aspects of CIoT to SA3 ZTE LSout  
(ask on short MAC-I, Inform on Resume Procedure)  
R2-163126 □ Draft LS on Bearer id list in Resume message 3 Intel LSout to: SA2  
R2-163127 LS to CT1 and RAN3 on DRX agreements Ericsson LSout

Potential email discussions to capture NB-IoT agreements in 36.300, 36.304, 36.321, 36.331, 36.322, 36.306, 36.323? and to reflect RAN1 agreements in 36.302?

## Annex J: History

| Document history                                                                                                                                                                      |                  |                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------|
| Date                                                                                                                                                                                  | TSG RAN WG2 Tdoc | Subject                                                                    |
| 04.04.2016                                                                                                                                                                            | -                | Skeleton report for RAN WG2 #93bis provided before the meeting             |
| 05.04.2016                                                                                                                                                                            | -                | Update 1 of skeleton report for RAN WG2 #93bis provided before the meeting |
| 07.04.2016                                                                                                                                                                            | -                | Update 2 of skeleton report for RAN WG2 #93bis provided before the meeting |
| 09.04.2016                                                                                                                                                                            | -                | Update 3 of skeleton report for RAN WG2 #93bis provided before the meeting |
| 11.04.2016                                                                                                                                                                            | -                | Update 4 of skeleton report for RAN WG2 #93bis provided before the meeting |
| 22.04.2016                                                                                                                                                                            | -                | Draft report v0.1 for RAN WG2 #93bis provided after the meeting            |
| 11.05.2016                                                                                                                                                                            | R2-163301        | Draft report v1.0 for RAN WG2 #93bis provided after the meeting            |
| 26.05.2016                                                                                                                                                                            | R2-163341        | Draft report v2.0 for RAN WG2 #93bis provided after the meeting            |
| 27.05.2016                                                                                                                                                                            | R2-163343        | Report v3.0 for RAN WG2 #93bis provided after the meeting                  |
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