3GPP TSG RAN WG2 Meeting #111-e R2-200xxxx

**Electronic meeting,** **17th – 28th August 2020**

**Agenda item:** 6.1.2

**Source:** Intel Corporation, NTT DoCoMo

**Title:** Report of email discussion AT111-e][015][NR16] UE cap Main

**Document for:**  Discussion and decision

# Introduction

This triggers the email discussion below from the capability session:

* [AT111-e][015][NR16] UE cap Main (Intel, NTT Docomo)

Scope: Treat assigned tdocs, merge endorsed output from other R16 UE caps (306 331) email discussions, take into account updated feature lists from R1 and R4. Produce final mega CRs 38306 38331.

Part 1: W1 Agree/Endorse 331 306 changes based on assigned tdocs.

Deadline for comments: Aug 20, 1000 UTC.

Part 2: W2 Review of updated R1 R4 feature lists. Agree on updates to 306 331 capturing updates from R1 and R4 based on rapporteur proposal, and merged endorsed output of other email discussions, Start TBD (Tuesday Aug 25?).

As Part 1 of the email discussion highlighted, it is to discuss the following assigned Tdocs:

MDT SON

Moved from 6.10.3 – Treated in UE Cap Main discussion

[R2-2006647](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2006647.zip) Correction on RLF Report for Inter-RAT MRO EUTRA CATT CR Rel-16 38.306 16.1.0 0365 - F NR\_SON\_MDT-Core

[R2-2007781](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2007781.zip) Correction to 38306 on inter-RAT MRO feature ZTE Corporation, Sanechips CR Rel-16 38.306 16.1.0 0385 - F NR\_SON\_MDT-Core

2-Step RACH

Moved from 6.11.3 – Treated in UE Cap Main discussion

[R2-2006577](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2006577.zip) Clarification on 2-step RACH capability vivo CR Rel-16 38.306 16.1.0 0364 - F NR\_2step\_RACH-Core

NR-U

Copied from 6.3.3 (for reference) – R2 aspects treated under AI 6.3.3 as a UE cap short discussion (see above), R1 and R4 related aspects can wait until R1 R4 information has been received and then treated in UE Cap Main discussion.

[R2-2007597](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2007597.zip) NR-U features in 38.306 Ericsson discussion NR\_unlic-Core

In addition, I have added the following which contains some impact to UR capability:

[R2-2007596](file:///D:\Documents\3GPP\tsg_ran\WG2\TSGR2_111-e\Docs\R2-2007596.zip) Remaining RRC issues Ericsson discussion NR\_unlic-Core

The outcome is to include the agreeable CRs/changes to the current endorsed mega CRs (R2-2008118 [TS38.331] and R2-2008119[TS38.306]).

# Discussion

## 2-Step RACH capability CR

In [R2-2006577](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2006577.zip), the current *twoStepRACH-r16* does not include the 2-step CFRA procedure for HO in the description. It proposed to include the following text in *twoStepRACH-r16*:

| ***twoStepRACH-r16***  Indicates whether the UE supports the following basic structure and procedure of 2-step RACH:  - Fallback procedures from 2-step RA type to 4-step RA type;  - MSGA PRACH resource and format determination;  - MSGA PUSCH configuration;  - Validation and transmission of MSGA PRACH and PUSCH;  - Mapping between preamble of MSGA PRACH and PUSCH occasion with DMRS resource of MSGA PUSCH;  - MSGB monitoring and decoding;  - PUCCH transmission for HARQ-ACK feedback to a MSGB;  - Power control for MSGA PRACH, MSGA PUSCH and PUCCH carrying HARQ-ACK feedback to MSGB;  - Reconfiguration with sync using a contention free random access with 2-step RA type on MSGA PRACH and PUSCH resources that are associated with SSB resources of the target cell. | UE | No | No | No |
| --- | --- | --- | --- | --- |

In the last meeting, RAN2 agreed not to have separate capability signaling for 2-step CFRA. The twoStepRACH-r16 should indicate the support of both the 2-Step CBRA and CFRA capability.

1. Companies are requested to provide their view on whether to include the 2-Step CFRA procedure for HO as one of the basic components in *twoStepRACH-r16*:

|  |  |  |
| --- | --- | --- |
| **Company’s name** | **Agree/Disagree** | **Company’s comments, if any**  **(e.g. Agree but think that some changes are needed to the text to make it clearer. If not agree, why? etc.)** |
| Intel | No strong view | Our understanding is that the twoStepRACH-r16 covers both CBRA and CFRA and it is clear that CFRA is just for HO from stage 3 specs. |
| Huawei, HiSilicon  (Yiru Kuang) | Agree |  |
| NTT DOCOMO | No strong opinion, but | It is not clear if all of the component descriptions in the UE feature list have to be imported into TS. As Intel commented, it is somewhat obvious. Given the fact that the feature list sometimes describes trivial things, it would be better to filter them out. |
| ZTE | Agree | We are okay to capture this.  However, in general, we note that the basic feature set of a given feature is not an exhaustive list (i.e. there may be some features which are not listed in this list but are still mandatory for the UE to support the feature). It is worth capturing this clarification explicitly at some place to avoid any misunderstanding of the supported feature set. |
| CATT | no strong view | ZTE comments are reasonable to us. |
| Vivo (Chenli) | Agree | In our opinion, it will be better for RAN2 to clarify that 2-step CFRA procedure is a part of the basic operation of 2-step RACH procedure, considering that the 2-step CFRA procedure is not given in the UE feature list (e.g. 2-step CFRA procedure is entirely agnostic to RAN1). |
| LG | Disagree | RAN2 has already made agreement “UE shall support 2-step CFRA for the SSB case if the UE supports 2-step RA”. This capability parameter indicates that UE supports procedure of 2-step RACH which means the UE supports 2-step CFRA.  Moreover, RA functions, which are essentially performed regardless of the purpose of RA (e.g. handover), should be considered as basic component. But, the proposed text is just a network configuration using the already included components (e.g., MSGA PUSCH configuration, MSGA PRACH resource).  If we include “2-step CFRA for HO” as basic component, we will have to add 2-step CFRA for other purposes as basic component whenever 2-step CFRA is supported for the other purposes (e.g., BFR, PDCCH order and so on) at the next Releases. |
| OPPO | Agree | Agree with ZTE’s comment |
| Samsung | See comments | There is no need to list all the components of 2 step RACH procedure. The simplest would be to just say that “***twoStepRACH-r16*** indicates whether the UE supports the 2 step RACH procedure (i.e. both CBRA and CFRA)”  ***twoStepRACH-r16***  Indicates whether the UE supports ~~following basic structure and procedure of~~ 2-step RACH (i.e. both CBRA and CFRA):  - ~~Fallback procedures from 2-step RA type to 4-step RA type;~~  ~~- MSGA PRACH resource and format determination;~~  ~~- MSGA PUSCH configuration;~~  ~~- Validation and transmission of MSGA PRACH and PUSCH;~~  ~~- Mapping between preamble of MSGA PRACH and PUSCH occasion with DMRS resource of MSGA PUSCH;~~  ~~- MSGB monitoring and decoding;~~  ~~- PUCCH transmission for HARQ-ACK feedback to a MSGB;~~  ~~- Power control for MSGA PRACH, MSGA PUSCH and PUCCH carrying HARQ-ACK feedback to MSGB~~ |
| Ericsson | Agree | We think it can be useful to have some simple text clarifying the support for CFRA (HO only currently) |

## MDT/SON capability CR

In [R2-2007781](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007781.zip), it claims that It is agreed in email discussion [AT110-e][802] that one optional feature is used to indicate the reconnected RLF and RLF report for inter-RAT MRO feature, which is aligned with the procedure part specified in TS 38.331 while in TS 38.306 they are separated into two optional features. The resolution is to merge reconnected RLF report for inter-RAT MRO EUTRA and Radio link report for inter-RAT MRO into one feature as follow:

5.2 UE receiver features

| **Definitions for feature** |
| --- |
| SU-MIMO Interference Mitigation advanced receiver  - R-ML (reduced complexity ML) receivers with enhanced inter-stream interference suppression for SU-MIMO transmissions with rank 2 with 2 RX antennas  - R-ML (reduced complexity ML) receivers with enhanced inter-stream interference suppression for SU-MIMO transmissions with rank 2, 3, and 4 with 4 RX antennas  UE supporting the feature is required to meet the Enhanced Receiver Type requirements in TS 38.101-4 [18]. |
| Relaxed measurement  Indicates whether the UE supports relaxed RRM measurements of neighbour cells in RRC\_IDLE/RRC\_INACTIVE as specified in TS 38.304 [21]. |
| Mobility history information storage  It is optional for UE to support the storage of mobility history information and the reporting in *UEInformationResponse* message as specified in TS 38.331 [9]. UE is not required to report this capability. |
| Cross RAT RLF Report  Indicates whether the UE supports delivery of EUTRA RLF report to an NR node upon request from the network. UE is not required to report this capability. |
| Radio Link Failure Report for inter-RAT MRO EUTRA  Indicates whether the UE supports:  - include EUTRA CGI, if available, or otherwise include the physical cell identity and carrier frequency of the target PCell of the failed handover, and associated TAC as *failedPCellId* in *RLF-Report* as specified in TS 38.331 [9].  - include EUTRA CGI and associated TAC as *previousPCellId* in *RLF-Report* as specified in TS 38.331 [9].  - include *eutra-CellIdentity* in *reconnectionCellIdentity* in the *VarRLF-Report* upon UE has radio link failure or handover failure and successfully re-connected to an E-UTRA cell as specified in TS 38.331 [9]. |

[R2-2006647](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2006647.zip) seems to have a similar change.

1. Companies are requested to provide their view on merging the 2 features into 1 as in the above (5.2 UE receiver features):

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| --- | --- | --- |
| **Company’s name** | **Agree/Disagree** | **Company’s comments, if any**  **(e.g. Agree but think that some changes are needed to the text to make it clearer. If not agree, why? etc.)** |
| Intel | Agree (either wording in 7781 or 6647 is fine with us) | We have the same understanding to merge the 2 features into one. |
| Huawei, HiSilicon | Agree | Firstly, we think both 7781 and 6647 have very similar changes. Secondly, we think the changes make sense, and either of CRs is ok. |
| NTT DOCOMO | Agree | Agree on the intention of proposed changes. |
| ZTE | Agree (proponent) |  |
| CATT | Agree (proponent of 6647) | First of all these changes are based on the agreement from email discussion [AT110-e][802][SONMDT] UE capabilities (CMCC, vivo) so should be agreeable in general.  Then we tend to think our proposed changes from 6647 still have some difference compared to #7781.  More specifically in the proposal from **ZTE CR #7781**  …  *include EUTRA CGI, if available, or otherwise include the physical cell identity and carrier frequency of the target PCell of the failed handover, and associated TAC as failedPCellId in RLF-Report as specified*  *..*  But in **CATT CR #6647** there is  ...  *Include EUTRA CGI and associated TAC, if available, and otherwise to include the physical cell identity and carrier frequency of the target PCell of the failed handover*  ..  We believe the 2nd way (i.e.,. #6647 is more suitable/accurate), and the reason is that EUTRA CGI and associated TAC should be used jointly. There should be no combination such as { physical cell identity and carrier frequency + TAC}, which seems to be the output of the ZTE CR.  So from technical point of view we’d suggest companies to take a closer look and share their views here. |
| vivo | Agree with changes | We are fine with the intention. Just one editorial comment for the rapporteur to consider, i.e. to align with TS 38.331,  the terminology “*eutra-CellIdentity*” should be “*eutraReconnectCellId*”, and the terminology “*reconnectionCellIdentity*” should be “*reconnectCellId*”. |
| Samsung | Agree  (prefer #6647) | We are fine for the intention of this CR, no strong view on the detail text but we slightly prefer #6647. |
| Ericsson | Agree | Either of the CRs is fine as they address the same issue. |

## NR-u capability discussion

In [R2-2007596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007596.zip), it is proposed:

**Proposal 4** “*UnlicensedParametersPerBand*” is replaced with “*SharedSpectrumChAccessParams*”

Reasoning:

The *UnlicensedParametersPerBand* is signalled as a child of *BandNR*, and thus, we do not need to repeat in the IE name that these parameters are per band.

1. *UnlicensedParametersPerBand* is signalled as a child of *BandNR*.

Also, since we do not use “unlicensed” in the RAN specifications and use shared spectrum channel access and channel access mode to point to cover the semi-static and dynamic channel access modes, we propose to align such naming and to keep the names short, we propose to replace “*UnlicensedParametersPerBand*” with “*SharedSpectrumChAccessParams*”.

From the Rapporteur’s point of view, we have done that also for MIMO as *MIMO-ParametersPerBand*. This makes it clearer that it is child of BandNR. Hence the change should be from “*UnlicensedParametersPerBand”* to “*SharedSpectrumChAccessParamsPerBand”*.

1. Companies are requested to provide their view on (A) Proposal 4 in [R2-2007596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007596.zip) or (B) change from “*UnlicensedParametersPerBand”* to “*SharedSpectrumChAccessParamsPerBand”*

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| **Company’s name** | 1. **or (B)** | **Company’s comments, if any** |
| Intel | Prefer (B) | As per the rapporteur’s understanding |
| Huawei, HiSilicon | (B) | We don't use the wording “unlicensed” in our spec. |
| NTT DOCOMO | (B) | O.K not to use “unlicensed” to align with the other specs. |
| ZTE | (B) | We agree that it is better to avoid the word “unlicensed” in the field names etc. |
| vivo | (B) | We agree with the rapporteur. |
| OPPO | (B) |  |
| Samsung | (B) | We agree with the rapporteur. |
| Ericsson | Prefer (A), i.e. *SharedSpectrumChAccessParams* | This is mainly to comply with the ASN.1 identifier naming conventions to avoid identifiers longer than 25 characters. Another example in *BandNR* that contains per band parameters is “*SpatialRelationsSRS-Pos-r16*” where the identifier name does not contain “*PerBand*”. |

In [R2-2007596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007596.zip), it is also proposed:

Proposal 5 Group channel access related capabilities in “*ChannelAccessParameters*”

From the rapporteur point of view, it is unclear what parameters this grouping is referring to. Currently there are only FG10-1 and 10-2 for LBE while FG10-1a and 10-2a for FBE. The grouping does not seem to save any bit in the structure.

1. Companies are requested to provide their view on Proposal 5 in [R2-2007596](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007596.zip):

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| **Company’s name** | **Agree/Disagree** | **Company’s comments, if any**  **(e.g. Agree but think that some changes are needed to the text to make it clearer. If not agree, why? etc.)** |
| Intel | No strong view | It is not clear to us which parameters are to be grouped. Are the parameters to group FG10-1, 10-2 for LBE and FG10-1a and FG10-2a for FBE? |
| Huawei, HiSilicon | Disagree | Motivation is not clear and agree with the comments from rapporteur. |
| NTT DOCOMO | No strong view, but | Incline to Intel’s view that it seems not a clear-cut motivation. |
| ZTE | No strong view | We agree with the rapporteur. |
| CATT | No strong view |  |
| vivo | Disagree | In our understanding, the channel access related capabilities are only applicable for NR-U case (i.e. not common for other features). We cannot find out the reason why we should additionally use a new separate class “*ChannelAccessParameters*”. |
| OPPO | Disagree | Not clear about the motivation |
| Samsung | Agree | We understand that the proposal merely improves the readability, and support the proposal unless it creates (unnecessary) NBC issues. |
| Ericsson |  | The parameters below are related to the channel access mode (R1-2005110). They could either be listed together or in a separate parameter set, e.g. “*ChannelAccessParameters*” or “*ChannelAccessParams*”. The grouping is intended to increase readability by keeping functional elements together without affecting the signaling overhead.   |  |  | | --- | --- | | **Index** | **Feature group** | | 10-1 | UL channel access for dynamic channel access mode | | 10-1a | UL channel access for semi-static channel access mode | | 10-2 | SSB-based RRM for dynamic channel access mode | | 10-2a | SSB-based RRM for semi-static channel access mode | | 10-2c | SSB-based RLM for dynamic channel access mode | | 10-2d | SSB-based RLM for semi-static channel access mode | | 10-2g | SSB-based BFD/CBD for dynamic channel access mode | | 10-2h | SSB-based BFD/CBD for semi-static channel access mode | |

For [R2-2007597](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007597.zip), it is proposed:

1. UE capability for extended RAR window is optional for NR-U UEs in LAA scenarios.
2. Move the parameters (partly pending RAN1 decision) that are also applicable for licensed spectrum one level up to *BandNR* or to another appropriate feature group.

Since both are being discussed in RAN1, RAN2 should first wait for RAN1 feature list before making changes.

# Conclusion

The proposals captured are the following:

# References