**3GPP TSG-RAN WG2 Meeting #114-e *R2-210xxxx***

**E-meeting, 19th May – 27th May 2021**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.306** | **CR** | **0578** | **rev** | **1** | **Current version:** | **16.4.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Introduction of the intra-NR and inter-RAT HST Capabilities |
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| ***Source to WG:*** | Apple, OPPO, CATT, Nokia, Nokia Shanghai Bell, Ericsson |
| ***Source to TSG:*** | R2  |
|  |  |
| ***Work item code:*** | NR\_HST-Core |  | ***Date:*** | 2021-04-28 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | In RAN4 LS (R4-2105855), RAN4 agreed to add two additional UE feature groups 10-4 and 10-5 for NR support for high speed train scenario as below, and requests RAN2 to define the corresponding UE capabilities. In * 10-4) Support of intra-NR HST RRM measurement with speed up to 500km/h
* 10-5) Support of NR-LTE inter-RAT RRM measurement with speed up to 500km/h
* Note: UE can indicate support of 10-4 or 10-5 only if 10-1 is NOT supported

In addition, RAN4 agreed to clarify that the feature groups 10-1, 10-2 for NR support for high speed train scenario are optional with capability signalling.*10-1: RRM enhanced requirements specified within NR and NR-E-UTRAN inter-RAT measurement for NR HST.**10-2: Demodulation enhancement for HST-SFN joint transmission scheme* |
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| ***Summary of change:*** | 1. Introduce the two new capabilities to indicate the support of the intra-NR and NR-LTE inter-RAT HST RRM measurement.
2. Clarify the two new capabilities can not be indicated if UE supports *measurementEnhancement-r16.*
3. Clarify the two new capabilities can not be indicated simultaneously.
4. Clarify measurementEnhancement-r16 and *demodulationEnhancement-r16* are not mandatory features.

**Impact analysis**Impacted 5G architecture options: NE-DC, NR SA  Impacted functionality: HST feature  Inter-operability: * If the UE is implemented according to the CR and the network is not, there is no inter-operability issue.
* If the network is implemented according to the CR and the UE is not, there is no inter-operability issue.
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| ***Consequences if not approved:*** | UE cannot indicate its support of the HST capability if UE supports the HST RRM measurement only in intra-NR or in NR-LTE inter-RAT.  |
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| ***Clauses affected:*** | 4.2.19 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.331CRxxxx |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |   |
|  |  |
| ***This CR's revision history:*** |  |

--------------------------------- [Change Start] ----------------------------

4.2.19 High speed parameters

| **Definitions for parameters** | **Per** | **M** | **FDD-TDD****DIFF** | **FR1-FR2****DIFF** |
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| ***measurementEnhancement-r16***Indicates whether the UE supports the enhanced intra-NR and inter-RAT E-UTRAN measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [5]. This field applies to MN configured measurement enhancement when MR-DC is not configured and SN configured measurement enhancement when (NG)EN-DC is configured. | UE | No | No | FR1 only |
| ***demodulationEnhancement-r16***Indicates whether the UE supports the enhanced demodulation processing for HST-SFN joint transmission scheme with velocity up to 500km/h as specified in TS 38.101-4 [18]. This field applies to MN configured demodulation enhancement when MR-DC is not configured and SN configured demodulation enhancement when (NG)EN-DC is configured. | UE | No | No | FR1 only |
| ***intraNR-MeasurementEnhancement-r16***Indicates whether the UE supports the enhanced intra-NR measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [5]. This field applies to MN configured measurement enhancement when MR-DC is not configured and SN configured measurement enhancement when (NG)EN-DC is configured.The UE can include this field only if the UE does not indicate the support of *measurementEnhancement-r16* and *interRAT-MeasurementEnhancement-r16*.Otherwise, the UE does not include this field. | UE | No | No | FR1 only |
| ***interRAT-MeasurementEnhancement-r16***Indicates whether the UE supports the enhanced inter-RAT E-UTRAN measurement requirements to support high speed up to 500 km/h as specified in TS 38.133 [5]. This field applies to MN configured measurement enhancement.The UE can include this field only if the UE does not indicate the support of *measurementEnhancement-r16* and *intraNR-MeasurementEnhancement-r16*. Otherwise, the UE does not include this field. | UE | No | No | FR1 only |

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