**3GPP TSG-RAN2 Meeting #111e** ***R2-200xxxx***

**17 – 28. August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **37.340** | **CR** | **0222** | **rev** | **1** | **Current version:** | **16.2.0** |  |
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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 |  | Core Network |  |

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| ***Title:*** | Mandatory support of full rate user plane integrity protection in MR-DC | | | | | | | | | |
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| ***Source to WG:*** | Deutsche Telekom, Intel Corporation, Broadcom, CMCC, Futurewei, Mediatek, Qualcomm, Telstra, Vodafone, Swift Navigation, BOSCH, Erillisverkot  [BT, Huawei, HiSilicon, Siemens, ORANGE, BMWi, , Telefonica, , NCSC, KPN, , AT&T, SEQUANS, Telia Company, , A.S.T.R.I.D. S.A., NTT DOCOMO INC, , FirstNet, Bell Mobility, Samsung?] | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI16 | | | | |  | ***Date:*** | | | 2020.08.25 |
|  |  | | | |  | |  | | |  |
| ***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 can be 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:*** | | With the current limitation of UE signalling the support of user plane integrity protection for only 64kbps and full data rate, the security of UEs operating in NR connected to the 5GC (both NR SA and MR-DC) cannot be guaranteed.  GSMA has been informed about security breaches, and subsequently informed 3GPP, where 3GPP SA#88-e decided to mandate full rate user plane integrity protection of UEs operating in NR connected to 5GC starting from Rel-16. This applies not only to NR SA but also to NR-DC, where both MN and SN terminated DRBs of a PDU session can be integrity protected. A corresponding CR to TS 33.501 has been approved at SA#88e in SP-200628. For NE-DC it was discussed at RAN2#111e to also apply full rate UPIP for MN terminated bearers as well (as the NR PDCP entity terminatating these bearers would typically be capable of handling it).  SA#88e [SP-200617] tasked relevant WGs to agree corresponding CRs to their specifications at their next meeting for Rel-16 accordingly. | | | | | | | | |
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| ***Summary of change:*** | | It is clarified in chapter 9 that UEs configured to operate in NR-DC and in NE-DC with MN terminated bearers are also required to mandatorily support user plane integrity protection at any data rate, up to and including the highest data rate supported by the UE for UL and DL, as required in TS 38.300 for Rel-16. | | | | | | | | |
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| ***Consequences if not approved:*** | | It is not clear whether also UEs configured to operate in NR-DC or NE-DC with MN terminated bearers would require mandatory support of user plane integrity protection at any data rate, up to and including the highest data rate supported by the UE for UL and DL. | | | | | | | | |
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| ***Clauses affected:*** | | 9 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | 3GPP TS 38.300, 3GPP TS 24.501 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

START CHANGE

# 9 Security related aspects

MR-DC can only be configured after security activation in the MN.

In EN-DC and NGEN-DC, for bearers terminated in the MN the network configures the UE with KeNB; for bearers terminated in the SN the network configures the UE with S-KgNB. In NE-DC, for bearers terminated in the MN the network configures the UE with KgNB; for bearers terminated in the SN the network configures the UE with S-KeNB. In NR-DC, for bearers terminated in the MN the network configures the UE with KgNB; for bearers terminated in the SN the network configures the UE with S-KgNB.

In NE-DC and NR-DC, a PCell change without KgNB change does not require a S-KeNB change (NE-DC case) or a S-KgNB change (NR-DC case).

In EN-DC, NGEN-DC and NR-DC, for a PSCell change that does not require a KeNB change (i.e. no simultaneous PCell handover in EN-DC and NGEN-DC) or a KgNB change (in NR-DC), S-KgNB key refresh is not required if the PDCP termination point of the SN is not changed. In NE-DC, a PSCell change always requires a S-KeNB change.

In EN-DC, the UE supports the NR security algorithms corresponding to the E-UTRA security algorithms signalled at NAS level and the UE NR AS Security capability is not signalled to the MN over RRC. Mapping from E-UTRA security algorithms to the corresponding NR security algorithms, where necessary, is performed at the MN.

For MR-DC with 5GC, UP integrity protection can be configured on a per radio bearer basis. All DRBs which belong to the same PDU session always have the same UP integrity protection activation, i.e., either on or off:

- For NR-DC: MN and/or SN terminated DRBs of a PDU session can have UP integrity protection activation either on or off. A UE configured to operate in NR-DC shall support integrity protection for all DRBs (MN and SN terminated) at any data rate, up to and including the highest data rate supported by the UE for both UL and DL (see TS 38.300 [3]).

- For NE-DC: MN terminated DRBs of a PDU session can have UP integrity protection activation on; however, in this case, the MN will not at any point offload any DRB of such PDU session to the SN. A UE configured to operate in NE-DC shall support integrity protection for all MN terminated DRBs at any data rate, up to and including the highest data rate supported by the UE’s radio access capabilities for MN for both UL and DL (see TS 38.300 [3]). SN terminated DRBs of a PDU session always have UP integrity protection activation off.

- For NGEN-DC: Both MN terminated and SN terminated DRBs of a PDU session always have UP integrity protection activation off.

END OF CHANGES