**3GPP TSG-SA5 Meeting #137e *S5-213301Rev1***

**e-meeting 10th - 19th May 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **28.554** | **CR** | **0081** | **rev** | **-** | **Current version:** | **17.2.0** |  |
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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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Add EE KPI for eMBB network slice based on RAN measurements | | | | | | | | | |
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| ***Source to WG:*** | Orange, AT&T, Deutsche Telekom, Telefonica, Huawei | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | EE5GPLUS | | | | |  | ***Date:*** | | | 30/04/2021 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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:*** | | The existing EE KPI definition for eMBB network slice is based on measurements made at UPFs. Therefore, it can’t apply in case of a RAN-only eMBB network slice or when the operator prefers to use RAN measurements. | | | | | | | | |
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| ***Summary of change:*** | | Add a new EE KPI definition based on measurements made at gNB. | | | | | | | | |
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| ***Consequences if not approved:*** | | It would not be possible to measure the energy efficiency of eMBB network slice based on RAN measurements. | | | | | | | | |
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| ***Clauses affected:*** | | 6.7.2.2a (New) | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **1st change** |

#### 6.7.2.2a Energy efficiency of eMBB network slice – RAN-based

##### 6.7.2.2a.1 Definition

a) EERANonlyeMBB,DV

b) A KPI that shows the energy efficiency of network slices of type eMBB based on NR measurements. The Pns for a network slice of type eMBB is obtained by summing up UL and DL data volumes at F1-U, Xn-U and X2-U interface(s) of gNBs, on a per S-NSSAI basis.

c)

For non-split gNBs:



, where:

- DRB.PdcpSduVolumeUl.*SNSSAI* is the Data Volume (amount of PDCP SDU bits) in the uplink delivered to PDCP layer per S-NSSAI - see TS 28.552 [4] clause 5.1.2.1.2.1,

- DRB.PdcpSduVolumeDl.*SNSSAI* is the Data Volume (amount of PDCP SDU bits) in the downlink delivered to PDCP layer per S-NSSAI - see TS 28.552 [4] clause 5.1.2.1.1.1.

For split gNBs:



, where:

- DRB.F1uPdcpSduVolumeDl.*SNSSAI* is the number of DL PDCP SDU bits sent to GNB-DU (F1-U interface) per S-NSSAI - see TS 28.552 [4] clause 5.1.3.6.2.3,

- DRB.F1uPdcpSduVolumeUl.*SNSSAI* is the number of UL PDCP SDU bits entering the GNB-CU-UP from GNB-DU (F1-U interface) per S-NSSAI - see TS 28.552 [4] clause 5.1.3.6.2.4,

- DRB.XnuPdcpSduVolumeDl.*SNSSAI* is the number of DL PDCP SDU bits sent to external gNB-CU-UP (Xn-U interface) per S-NSSAI - see TS 28.552 [4] clause 5.1.3.6.2.3,

- DRB.XnuPdcpSduVolumeUl.*SNSSAI* is the number of UL PDCP SDU bits entering the GNB-CU-UP from external gNB-CU-UP (Xn-U interface) per S-NSSAI - see TS 28.552 [4] clause 5.1.3.6.2.4,

- DRB.X2uPdcpSduVolumeDl.*SNSSAI* is the number of DL PDCP SDU bits sent to external eNB (X2-U interface) per S-NSSAI - see TS 28.552 [4] clause 5.1.3.6.2.3,

- DRB.X2uPdcpSduVolumeUl.*SNSSAI* is the number of UL PDCP SDU bits entering the GNB-CU-UP from external eNB (X2-U interface) per S-NSSAI - see TS 28.552 [4] clause 5.1.3.6.2.4.

The final Network Slice EE KPI definition, based on Data Volume, for RAN-only eMBB type of network slice, would be defined as follows:



, where ECRANonlyns is the energy consumption of the RAN-only network slice over the same observation period.

NOTE: the definition of ECRANonlyns is FFS.

d) NetworkSlice

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| **End of changes** |