**3GPP TSG-SA5 Meeting #132e *S5-204435rev3***

**e-meeting 17th - 28th August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **2** | **Current version:** |  |  |
|  | | | | | | | | |
| *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 measurements for RACH optimization management for NR | | | | | | | | | |
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| ***Source to WG:*** | , Intel | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *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:*** | | Measurements for RACH optimization mangagement are needed to support the RACH optimization SON function, specified in 28.313. | | | | | | | | |
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| ***Summary of change:*** | | Add measurements for RACH optimization management | | | | | | | | |
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| ***Consequences if not approved:*** | | The RACH optimizatoin functions's performance cannot be observed. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1.1.20.a, 5.1.1.20.b | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

##### 5.1.1.20.a Distribution of number of RACH preambles per cell

a) This measurement provides the distribution of the number of RACH preambles sent by the UE when successfully accessing the network, as reported by the UEs inside the *RA-ReportList-r16* IE in the *UEInformationResponse-r16* message. The measurement is incremented each time a *UEInformationResponse-r16* message containing a *RA-ReportList-r16* IE (see TS 38.331 [20]) is received.

b) CC.

c) Each of the *RA-Report-r16* IEs in the *RA-ReportList-r16* increments the measurement bin that is identified by *Bin*, where *Bin* corresponds to the number of RACH preambles sent to the cell denoted by *cellId-r16* before a successful connection establishment. The number of RACH preambles is equal to:

, where

“*n*” equals to the number of *numberOfPreamblesSentOnSSB-r16 IEs* in all *PerRASSBInfo-r16 IEs* in the *RA-Report-r16*,

“*numOfPreamblesPerSSB”* equals to *numberOfPreamblesSentOnSSB-r16* attribute in *PerRASSBInfo-r16* IE, See TS 38.331 [20] clause 6.2.2.

d) Each measurement is an integer value.

e) RACH.PreambleDist.*Bin*

where *Bin* is to identify the bins associated with the number of preambles sent.

NOTE: The number of *Bin*s and the range for each bin is left to implementation.

f) NRCellDU.

g) Valid for packet switched traffic.

h) 5GS.

i) One usage of this measurement is to support RACH optimization management, see TS 28.313 [30].

##### 5.1.1.20.b Distribution of RACH access delay

a) This measurement provides an estimate of the distribution of the RACH access delay, that is the interval from the time a UE sends its first RACH preamble until the UE is connected to the network. The measurement is incremented each time a *UEInformationResponse-r16* message containing a *RA-ReportList-r16* IE (see TS 38.331 [20]) is received.

b) CC.

c) Each of the *RA-Report-r16* IEs in the *RA-ReportList-r16* increments the measurement bin that is identified by *Bin*, where *Bin* corresponds to the UE RACH access delay for that particular *RA-Report-r16* received from UE. The access delay is estimated based on the value of *numberOfPreamblesSentOnSSB-r16* IE and *contentionDetected-r16* IE in *PerRAAttemptInfo-r16*, where *numberOfPreamblesSentOnSSB-r16* IE and *PerRAAttemptInfo-r16* IE are contained in *PerRASSBInfo-r16* IE. See TS 38.331 [20] clause 6.2.2.

NOTE: The estimate of the access delay is left to implementation.

d) Each measurement is an integer value.

e) RACH.AccessDelayDist.*Bin*

where *Bin* is to identify the bins associated with the RACH access delay.

NOTE: *Bin* and the range for each bin is left to implementation.

f) NRCellDU.

g) Valid for packet switched traffic.

h) 5GS.

i) One usage of this measurement is to support RACH optimization management, see TS 28.313 [30].