**3GPP TSG-SA5 Meeting #132-e *S5-204114***

**August 17 – 28, 2020** *s5-2abcde*

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| *CR-Form-v11.4* |
| **CHANGE REQUEST** |
|  |
|  | **28.552** | **CR** | **0004** | **rev** | **-** | **Current version:** | **16.6.0** |  |
|  |
| *For* [***HELP***](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 related to RACH optimization |
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| ***Source to WG:*** | Intel |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | SON\_5G |  | ***Date:*** | 2020-08-07 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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:*** | The measurements of probability distribution (e.g. UE access delay, number of attempts, …) and percentage of unsuccessful random-access are essential for RACH optimization SON function to monitor the RACH performance, and determine actions to optimize the RACH performance. |
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| ***Summary of change:*** | Add the following measurements:• Distribution of RACH preambles sent• Distribution of RACH access delay |
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| ***Consequences if not approved:*** | RACH optimization SON function cannot be completed |
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| ***Clauses affected:*** | Add subclauses to 5.1.1.20 |
|  |  |
|  | **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 ... |
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| ***Other comments:*** |  |

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| **1st Modified Section** |

# 5  Performance measurements for 5G Network Functions

#### 5.1.1.20 Received Random Access Preambles

##### 5.1.1.20.a Distribution of RACH preambles sent

a) This measurement provides the distribution of the number of RACH preambles UE sent to attach the network, based on the *RA-Report-r16* IEs in *UEInformationResponse-r16* message (see TS 38.331 [20]).

b) CC.

c) The measurement is obtained by incrementing the measurement bin that is identified by *Bin* that corresponds to the total number of preambles sent on SSB(s) =

, where

“*n*” equals to the number of SSB(s),

 “*numOfPreamblesPerSSB”* equals to *numberOfPreamblesSentOnSSB-r16* attribute in *PerRASSBInfo-r16* IE.

d) Each measurement is an integer value.

e) RACH.PreambleDistribution.*Bin*

where *Bin* is to identify the bin associated with the aggregate of the number of preambles sent on SSB(s).

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

f) NRCellCU.

g) Valid for packet switched traffic.

h) 5GS.

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

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

a) This measurement provides 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 attached to the network. based on the *RA-Report-r16* IEs in *UEInformationResponse-r16* message (see TS 38.331 [20]).

b) CC.

c) The measurement is obtained by incrementing the measurement bin that is identified by *Bin* that corresponds to the access delay that is calculated by the product of the total number of preambles sent on SSB(s) and the duration of sending a preamble.

NOTE: The calculation of the access delay from the product of the total number of preambles sent is left to implementation.

d) Each measurement is an integer value.

e) RACH.AccessDelayDistribution.*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) NRCellCU.

g) Valid for packet switched traffic.

h) 5GS.

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

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| **End of Modified Sections** |