**3GPP TSG-SA5 Meeting #158 *S5-247192***

Orlando, USA, 18 - 22 November 2024

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **28.554** | **CR** | **0213** | **rev** | **1** | **Current version:** | **19.1.0** |  |
|  |
| *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 | **X** |

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|  |
| ***Title:***  | Rel-19 CR TS 28.554 enhance the RAN UE throughput definition |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | PM\_KPI\_5G\_Ph4 |  | ***Date:*** | 2024-10-30 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | According to the figure 1 in clause 6.3.6.2, it states the last slot shall always be removed from calculations. However, for small data bursts, where all buffered data is not included in one initial HARQ transmission in case of UEs with poor channel quality, it will take two or more slots to transmit data in the buffer. Therefore, the last slot should be included in the total calculations. We propose to add an optional formula including the last slot DL transferred volume and last slot DL transferred time. |
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| ***Summary of change:*** | Enhance the formula with adding the last slot DL transferred volume and last slot DL transferred time.  |
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| ***Consequences if not approved:*** | The UE throughput may be inaccurate for small data bursts. |
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| ***Clauses affected:*** | 6.3.6.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** | **Y** |  |  O&M Specifications | TS 28.552 CR S5-246722  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

***Start of next change***

#### 6.3.6.2 RAN UE Throughput definition

To achieve a Throughput measurement (below examples are given for DL) that is independent of file size and gives a relevant result it is important to remove the volume and time when the resource on the radio interface is not fully utilized. (Successful transmission, buffer empty in figure 1).

Time (slots)

Data arrives to

empty DL buffer

First data is

transmitted to the UE

The send buffer is

again empty

ThpTimeDl

Failed transmission (

”

Block

error

”

)

Successful transmission,

buffer not empty

Successful transmission,

buffer empty

ThpVolDl =

∑

Total DL transferred volume =

∑

(kbits)

+

(kbits)

**UE Throughput in DL =**

**ThpVolDl+ThpVolDL\_LastSlot / ThpTimeDl+ThpTimeDl\_LastSlot (kbits/s)**

No transmission, buffer not

empty (e.g. due to contention)

ThpTimeDl\_LastSlot

**UE Throughput in DL =**

**ThpVolDl / ThpTimeDl (kbits/s)**

**The last slot can be removed from calulations since it can be impacted by packet size of User Plane (UP) packets.**

**For small data burst, the last slot should be included in the total calculations.**

ThpTimeDl =

∑

(ms)

Total DL transferred time =

+

(ms)

∑

ThpVolDl\_LastSlot =

∑

(kbits)

ThpTimeDl\_LastSlot =

∑

(ms)

Alternatively,

Figure 1

To achieve a throughput measurement that is independent of bursty traffic pattern, it is important to make sure that idle gaps between incoming data is not included in the measurements. That shall be done as considering each burst of data as one sample.

***End of change***