3GPP TSG SA WG5 Meeting 137-e TDoc S5-213080rev2

electronic meeting, online, 10 - 19 May 2021

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **28.554** | **CR** | **0079** | **rev** | **-** | **Current version:** | **17.2.0** |  |
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| *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 | **X** |

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| ***Title:***  | Update on energy efficiency of URLLC network slice |
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| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | EE5GPLUS |  | ***Date:*** | 2021-04-30 |
|  |  |  |  |  |
| ***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 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | According to the latest output of TR 28.813, it is proposed to update the KPI of energy efficiency of URLLC network slice to two variants. |
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| ***Summary of change:*** | Update the KPI of energy efficiency of URLLC network slice to two variants. |
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| ***Consequences if not approved:*** |  |
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| ***Clauses affected:*** | 6.7.2.3 |
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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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| **1st modified section** |

#### 6.7.2.3 Energy efficiency of URLLC network slice

##### 6.7.2.3.1 Introduction

This KPI is defined with two variants.

##### 6.7.2.3.2 Based on latency of the network slice

a) EEURLLC,Latency

b) A KPI that shows the energy efficiency of network slices of type URLLC. The Pns for a network slice of type URLLC is the inverse of the average end-to-end User Plane (UP) latency of the network slice. In this KPI variant, latency are the only factor considered for evaluating the performance of network slice.



, where ‘Network slice mean latency’ is defined as the average end-to-end User Plane (UP) latency of the network slice, and where the average end-to-end User Plane (UP) latency for one S-NSSAI is defined by:



This KPI is obtained by the inverse of the average end-to-end User Plane (UP) latency of the network slice divided by the energy consumption of the network slice. The unit of this KPI is (0.1ms \* J)-1.

c)



d) NetworkSlice

##### 6.7.2.3.3 Based on both latency and Data Volume (DV) of the network slice

a) EEURLLC,DV,Latency

b) A KPI that shows the energy efficiency of network slices of type URLLC. The Pns for a network slice of type URLLC is the sum of UL and DL traffic volumes at N3 interface on a per S-NSSAI basis multiplied by the inverse of the end-to-end User Plane (UP) latency of the network slice. In this KPI variant, data volume and latency are two factors considered for evaluating the performance of network slice. This KPI is applicable for the case of URLLC network slice is deployed and operators want to evaluate the slice EE KPI for different periods of time such as busy time slots (more DV) and idle time slots (less DV).



This KPI is obtained by the product of the sum of UL and DL traffic data volumes at N3 interface(s) of the network slice multiplied by the inverse of the end-to-end User Plane (UP) latency of the network slice, divided by the energy consumption of the network slice. The unit of this KPI is bit/(0.1ms\*J).

c)



d) NetworkSlice

e) In case of redundant transmission paths over the N3 interface for high reliability communication (cf. TS 23.501 [7] clause 5.33.2), it is expected that the data volume is counted once. In particular:

- In case of Dual Connectivity based end to end Redundant User Plane Paths (cf. TS 23.501 [7] clause 5.33.2.1), in which a UE may set up two redundant PDU Sessions over the 5G network, the Data Volume related to only one PDU session is to be considered;

- In case of redundant transmission with two N3 tunnels between the PSA UPF and a single NG-RAN node (cf. TS 23.501 [7] figure 5.33.2.2-1) which are associated with a single PDU Session, the Data Volume related to only one N3 tunnel is to be considered;

- In case of two N3 and N9 tunnels between NG-RAN and PSA UPF for redundant transmission (cf. TS 23.501 [7] figure 5.33.2.2-2) associated with a single PDU Session, the Data Volume related to only one N3 tunnel is to be considered.

The 3GPP management system in charge of collecting the data volume measurements listed here above shall consider them only once in case of redundant transmission over the N3 interface.

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| **End of modified section** |