3GPP TSG SA WG5 Meeting 137-e TDoc S5-213079rev1

electronic meeting, online, 10 - 19 May 2021

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **28.310** | **CR** | **0011** | **rev** | **-** | **Current version:** | **17.0.0** |  |
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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:*** | 6.1.2.4 |
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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** |

#### 6.1.2.4 Energy efficiency of URLLC network slice

##### 6.1.2.4.1 Introduction

This KPI is defined with two variants.

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

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.

In this KPI variant, latency is the only factor considered for evaluating the performance of network slice, i.e. the performance of network slice (Pns) for URLLC type of network slice is the inverse of the end-to-end User Plane (UP) latency of the network slice.



Where Network slice mean latency is defined as:



The following KPIs are used to calculate Network slice mean latency:

- DelayE2EUlNs: Average e2e uplink delay for a network slice, defined in TS 28.554 [18] clause 6.3.1.8.1 as the average e2e UL packet delay between the PSA UPF and the UE for a network slice;

- DelayE2EDlNs: Average e2e downlink delay for a network slice, defined in TS 28.554 [18] clause 6.3.1.8.2 as the average e2e DL packet delay between the PSA UPF and the UE for a network slice.

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

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).

In this KPI variant, data volume and latency are two factors considered for evaluating the performance of network slice, i.e. the performance of network slice (Pns) for URLLC type of network slice is the sum of UL and DL traffic data volumes at N3 interface(s) multiplied by the inverse of the end-to-end User Plane (UP) latency of the network slice. This solution 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 and idle time slots.



The following measurements, defined in TS 28.552 [15], are used to calculate the sum of UL and DL traffic data volumes at N3 interface(s) of the network slice:

- GTP.InDataOctN3UPF.SNSSAI: Number of octets of incoming GTP data packets on the N3 interface, from (R)AN to UPF), where SNSSAI identifies the S-NSSAI, as defined in TS 28.552 [15] clause 5.4.1.3;

- GTP.OutDataOctN3UPF.SNSSAI: Number of octets of outgoing GTP data packets on the N3 interface, from (R)AN to UPF), where SNSSAI identifies the S-NSSAI, as defined in TS 28.552 [15] clause 5.4.1.4.

The following KPIs, defined in TS 28.554 [18], are used to calculate the latency of the network slice:

- DelayE2EUlNs: Average e2e uplink delay for a network slice, defined in TS 28.554 [18] clause 6.3.1.8.1 as the average e2e UL packet delay between the PSA UPF and the UE for a network slice;

- DelayE2EDlNs: Average e2e downlink delay for a network slice, defined in TS 28.554 [18] clause 6.3.1.8.2 as the average e2e DL packet delay between the PSA UPF and the UE for a network slice.

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| **End of modified section** |