**3GPP TSG-SA5 Meeting #154 *S5-242025d1***

Changsha, China, 15 - 19 April 2024

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **28.552** | **CR** | **0554** | **rev** | **1** | **Current version:** | **18.6.0** |  |
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| *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:*** | Rel-19 CR TS 28.552 Add new measurements for DL ITI Time Domain Proportion | | | | | | | | | |
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| ***Source to WG:*** | China Unicom | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | PM\_KPI\_5G\_Ph4 | | | | |  | ***Date:*** | | | 2024-04-07 |
|  |  | | | |  | |  | | |  |
| ***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 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | At present, the network resource load is mainly evaluated through resource usage-related measurements. Referring to TS 28.552, the evaluation measurements are mainly PRB usage rate-related measurements, which measures usage (in percentage) of physical resource blocks (PRBs). Although these measurements can evaluate the overall resource load of the cell, they cannot effectively evaluate the resource load of the URLLC service under the eMBB and URLLC multiplexing scenarios.  For example, in a statistical time period, the PRB usage rate of the network is low. Because the URLLC service has high requirements for delay sensitivity, it needs to be transmitted immediately. At this time, on the small number of scheduled resources of the overall network resources, the URLLC service has data transmission requirements. But on these few scheduled resources, the resource requirements of URLLC services cannot be meet, so the EMBB service resources are preempted. In this case, since the PRB usage rate only reflects the overall resource load of the cell, it cannot reflect the situation that the resources of the URLLC service are insufficient at this time. | | | | | | | | |
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| ***Summary of change:*** | | New measurements DL ITI Time Domain Proportion should be added to better evaluate the DL resource load of URLLC services under multiplexing scenarios. | | | | | | | | |
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| ***Consequences if not approved:*** | | The existing PRB usage rate related measurements for evaluating network resource load cannot effectively evaluate the resource load of URLLC services under eMBB and URLLC multiplexing scenarios. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1.1.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

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| **1st Change** |

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1], TS 23.501 [4] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1] and TS 23.501 [4].

CHO Conditional Handover

CLI Cross Link Interference

DAPS Dual Active Protocol Stack

GP Guard Period

HO Handover

kbit kilobit (1000 bits)

LHO Legacy Handover

MA PDU Multi-Access PDU

MN Master Node.

MPQUIC Multi-Path QUIC

MPTCP Multi-Path TCP Protocol

NG-RAN Next Generation Radio Access Network

RNA RAN-based Notification Area

PI Performance Indicator

SA PDU Single-Access PDU

SN Secondary Node.

SRS Sounding Reference Signal

TEID Tunnel Endpoint IDentifier

ITI Interrupted Transmission Indication

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| **2nd Change** |

5.1.1.2.X DL ITI Time Domain Proportion

a) This measurement provides the proportion of time domain resources that invoke the downlink interrupted transmission indication feature (see clause 11.2 of TS 38.213 [64], and it will be represented as ITI (Interrupted Transmission Indication) in the following) in the statistical period. Taking a fixed time duration as one sampling occasion, the numerator of this measurement is the number of sampling occasions that invoke the ITI feature (when the number of preempted PRBs is greater than 0) and the denominator is the number of sampling occasions with DL data scheduled (eMBB, URLLC, etc.).

b) SI

c) This measurement is obtained as:,

where

denotes the proportion of time domain resources that invoke the ITI feature during the time period, with value range: 0-100%;

is the number of sampling occasions that invoke the ITI feature during the time period ,  *IT*;

is the invoking ITI feature result of sampling occasion , when the number of physical resource blocks (PRBs) that invoke the ITI feature at sampling occasion is greater than 0, = 1, and when the number of PRBs that invoke the ITI feature at sampling occasion is equal to 0, = 0;

is the number of sampling occasions with DL data scheduled during the time period ,；

is the DL data scheduled result of sampling occasion , when there is DL data scheduled at sampling occasion , =1, and when there is no DL data scheduled at sampling occasion , =0;

NOTE: DL data scheduled is scheduled data of user plane, such as eMBB data, URLLC data, etc.

denotes the time period during which measurement is performed;

denotes sampling occasion (e.g. 1 slot) during time period .

d) A single integer value from 0 to 100.

e) RRU.ITiDtDl, which indicates the proportion of time domain resources that invoke the ITI feature

f) NRCellDU

g) Valid for packet switched traffic

h) 5GS

i) One usage of this measurement is for evaluating the resource load of URLLC services under eMBB and URLLC multiplexing scenarios.

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| **3rd Change** |

# A.X Use case of measurements for DL ITI Time Domain Proportion

The measurement of DL total PRB usage when evaluating network resource load cannot effectively reflect the resource load of URLLC services under eMBB and URLLC multiplexing scenarios. For example, in a statistical time period, the PRB usage rate of the network is low. Because the URLLC service has high requirements for delay sensitivity, it needs to be transmitted immediately. At this time, on the small number of scheduled resources of the overall network resources, the URLLC service has data transmission requirements. But on these few scheduled resources, the resource requirements of URLLC services cannot be meet, so the eMBB service resources are preempted. In this case, since the PRB usage rate only reflects the overall resource load of the cell, it cannot reflect the situation that the resources of the URLLC service are insufficient at this time.

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| **End of Change** |