**3GPP TSG-SA5 Meeting #131eS5-204240rev3**

**e-meeting 25th May-3rd June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **28.552** | **CR** | **0256** | **rev** | **1** | **Current version:** | **16.6.0** |  |
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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 | **X** |

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| ***Title:*** | Add incoming and outgoing GTP data packet loss TEID | | | | | | | | | |
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| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | ePM\_KPI\_5G | | | | |  | ***Date:*** | | | 2020-08-26 |
|  |  | | | |  | |  | | |  |
| ***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 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-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:*** | | Performance measurement for UPF includes data volume of ougoing GTP packets per QoS level on the N3 interface from UPF to (R)AN. In this measurement scenario, performance measurements on incoming GTP data packet loss and outgoing GTP data packet loss are defined that is split into subcounters per QoS level (5QI). The measurement is obtained by a counter that use the number of missing incoming GTP sequence numbers (TS 29.281) among all GTP packets delivered by a gNB to an UPF interface.  This contribution is to add TEID information in GTP header as additional information to counter packet loss between gNB and UPF. The subcounter for TEID level would be more specific for packet loss measurement per GTP tunnel. | | | | | | | | |
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| ***Summary of change:*** | | Add two subcounters that uses TEID in measurements of incoming and outgoing packet loss on N3 interface in clause 5.4.1.7 and 5.4.1.8. | | | | | | | | |
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| ***Consequences if not approved:*** | | Current definition on measurements of incoming GTP data packet loss and outgoing GTP data packet loss on the N3 interface is not able to cover monitoring packet loss per GTP tunnel. | | | | | | | | |
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| ***Clauses affected:*** | | 2, 3.2, 5.4.1.7, 5.4.1.8, A.40 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  |  | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **1st Change** |

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 32.401: "Telecommunication management; Performance Management (PM); Concept and requirements".

[3] 3GPP TS 32.404: "Performance Management (PM); Performance measurements - Definitions and template".

[4] 3GPP TS 23.501: "System Architecture for the 5G System".

[5] IETF RFC 5136: "Defining Network Capacity".

[6] 3GPP TS 38.473: "NG-RAN; F1 Application Protocol (F1AP)".

[7] 3GPP TS 23.502: "Procedures for the 5G System".

[8] 3GPP TS 28.554: "Management and orchestration; 5G end to end Key Performance Indicators (KPI)".

[9] 3GPP TS 32.425: "Performance Management (PM); Performance measurements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN)".

[10] 3GPP TS 32.451: "Key Performance Indicators (KPI) for Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Requirements".

[11] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[12] Void.

[13] 3GPP TS 38.423: "NG-RAN; Xn Application Protocol (XnAP)".[14] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[15] Void.

[16] 3GPP TS 29.244: "Technical Specification Group Core Network and Terminals; Interface between the Control Plane and the User Plane Nodes; Stage 3".

[17] ETSI GS NFV-IFA027 v2.4.1: "Network Functions Virtualisation (NFV); Management and Orchestration; Performance Measurements Specification".

[18] Void.

[19] 3GPP TS 38.214: "NR; Physical layer procedures for data".

[20] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".

[21] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[22] 3GPP TS 29.413: "Application of the NG Application Protocol (NGAP) to non-3GPP access".

[23] 3GPP TS 29.122: "Technical Specification Group Core Network and Terminals; T8 reference point for Northbound APIs".

[24] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[25] ETSI ES 202 336-12 V1.2.1: "Environmental Engineering (EE); Monitoring and control interface for infrastructure equipment (power, cooling and building environment systems used in telecommunication networks); Part 12: ICT equipment power, energy and environmental parameters monitoring information model".

[26] 3GPP TS 28.541: "Management and orchestration; 5G Network Resource Model (NRM); Stage 2 and stage 3".

[27] 3GPP TS 29.274: "Evolved General Packet Radio Service (GPRS); Tunnelling Protocol for Control plane (GTPv2-C); Stage 3".

[28] 3GPP TS 29.510: "5G System; Network function repository services; Stage 3".

[29] 3GPP TS 38.314: "NR; layer 2 measurements".

[30] 3GPP TS 38.313: "Self-Organizing Networks (SON) for 5G networks".

[31] 3GPP TS 38.415: "NG-RAN; PDU session user plane protocol".

[32] 3GPP TS 38.321: "NR MAC protocol specification".

[33] 3GPP TS 38.214: "NR; Physical layer procedures for data".

[34] 3GPP TS 38.215: "NR; Physical layer measurements".

[x] 3GPP TS 29.281: "General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)"

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| **2nd Change** |

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1], 3GPP 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 3GPP TR 21.905 [1] and 3GPP TS 23.501 [4].

PI Performance Indicator.

kbit kilobit (1000 bits)

MN Master Node.

NG-RAN Next Generation Radio Access Network

NSI Network Slice Instance

SN Secondary Node.

TEID Tunnel Endpoint IDentifier

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| **3rd Change** |

##### 5.4.1.7 Incoming GTP Data Packet Loss

a) This measurement provides the number of GTP data packets which are not successfully received at UPF. It is a measure of the incoming GTP data packet loss per N3 on an UPF interface. The measurement is split into subcounters per QoS level (5QI) or subconters per GTP tunnel (TEID) or subcounters per QoS level per GTP tunnel (TEID).

b) CC.

c) This measurement is obtained by a counter: Number of missing incoming GTP sequence numbers (TS 29.281 [x]) among all GTP packets delivered by a gNB to an UPF interface. Separate subcounter is maintained for each 5QI. The separate subcounter can be maintained for a GTP tunnel identified by TEID.

d) Each measurement is an integer value representing the number of the lost GTP pakets. If the QoS level measurement is perfomed, the measurements are equal to the number of 5QIs.

e) The measurement name has the form GTP.InDataPktPacketLossN3UPF or GTP.InDataPktPacketLossN3UPF.QoS or GTP.InDataPktPacketLossN3UPF.TEID or GTP.InDataPktPacketLossN3UPF.TEID.QoSwhere QoS identifies the target quality of service class.

f) EP\_N3.

g) Valid for packet switched traffic.

h) 5GS.

##### 5.4.1.8 Outgoing GTP Data Packet Loss

a) This measurement provides the number of GTP data packets which are not successfully received at gNB over N3. It is a measure of the outgoing GTP data packet loss per N3 on an UPF interface. The measurement is split into subcounters per QoS level (5QI) or subconters per GTP tunnel (TEID) or subcounters per QoS level per GTP tunnel (TEID).

b) CC.

c) This measurement is obtained by a counter: Number of missing outgoing GTP sequence numbers (TS 29.281 [x]) among all GTP packets delivered by an UPF interface to a gNB. Separate counter is maintained for each 5QI.

d) Each measurement is an integer value representing the lost GTP packets.. If the QoS level measurement is perfomed, the measurements are equal to the number of 5QIs.

e) The measurement name has the form GTP.OutDataPktPacketLossN3UPF or GTP.OutDataPktPacketLossN3UPF.QoS or GTP.OutDataPktPacketLossN3UPF.TEID or GTP.OutDataPktPacketLossN3UPF.TEID.QoSwhere QoS identifies the target quality of service class.

f) EP\_N3.

g) Valid for packet switched traffic.

h) 5GS.

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| **4th Change** |

# A.40 Monitoring of incoming/outgoing GTP packet loss on N3

Keeping track of GTP data packet loss over N3 is essential, since for certain services packets that are lost along the way through the system may have a noticeable impact on the end user. Incoming/outgoing GTP data packet loss measurements can be useful for evaluation, optimization, and performance assurance between gNB and UPF in the core. It is also important for the performance measurement of end-to-end point of view from UE to UPF. Performance degradation can happen any point although the focus is centered more at UE and RAN. When the monitoring incoming/outgoing GTP packet loss on N3 requires specific measurements per GTP tunnel, the monitoring of incoming/outgoing GTP packet loss on N3 can use subcounters per TEID to provide the measurements within a GTP tunnel.

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| **End of Change** |