**3GPP TSG-SA5 Meeting #130eS5-202003**

**20 - 24 April 2020**

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| *CR-Form-v11.4* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **28.552** | **CR** | **0201** | **rev** | **-** | **Current version:** | **16.5.0** |  |
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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 |  |

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| ***Title:*** | Add new measurements for “Average Normally Released Call (5QI 1 QoS Flow) Duration” and “Average Abnormally Released Call (5QI 1 QoS Flow) Duration”. | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_SLICE\_ePA | | | | |  | ***Date:*** | | | 2020-04-10 |
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| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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:*** | | Improve monitoring of the retainability for the 5QI 1 QoS Flow services | | | | | | | | |
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| ***Summary of change:*** | | Measurements for “Distribution of Normally Released Call (5QI 1 QoS Flow) Duration” and “Distribution of Abnormally Released Call (5QI 1 QoS Flow) Duration” were added into 28.552 spec via CR0129 (3GPP TSG-SA5 Meeting #126). In order to provide operators complete statistical view it is recommended to introduce also measurements for “Average Normally Released Call (5QI 1 QoS Flow) Duration” and “Average Abnormally Released Call (5QI 1 QoS Flow) Duration” like it is for other cases when distribution is followed also with monitoring of average value. | | | | | | | | |
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| ***Consequences if not approved:*** | | The full statistical monitoring of retainability of the 5QI 1 QoS Flow services as closer as to what end user perceives cannot be provided. | | | | | | | | |
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| ***Clauses affected:*** | | 5.1.3.x (new measurements) A.28 | | | | | | | | |
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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:*** | |  | | | | | | | | |

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| **1st Modified Section** |

#### 5.1.3.x Average Normally Released Call (5QI 1 QoS Flow) Duration

a) This measurement provides the average value of normally released call (5QI 1 QoS Flow) duration.

b) CC

c) The measurement is done as an arithmetical average of the samples of normally released calls (5QI 1 QoS Flows) duration at the end of measurement period. Each sample is measured from the point in time the 5QI 1 QoS Flow has been successfully established via initial Context setup procedure (INITIAL CONTEXT SETUP RESPONSE message sent by NR CU cell to AMF according to 3GPP TS 38.413 [11]) or additional 5QI 1 QoS Flow setup procedure (PDU SESSION RESOURCE SETUP RESPONSE or a PDU SESSION RESOURCE MODIFY RESPONSE message sent by NR CU cell to AMF according to 3GPP TS 38.413 [11]) or incoming handover (HANDOVER REQUEST ACKNOWLEDGE sent by target NR CU cell to AMF in case of NG intra/inter-system handover or sent by target to source NR CU cell via Xn in case of Xn based handover according to 3GPP TS 38.413 [11]) till the point in time the 5QI 1 QoS Flow is released via gNB (UE CONTEXT RELEASE REQUEST message sent by NR CU cell to AMF according to 3GPP TS 38.413 [11]) or AMF initiated release procedure (UE CONTEXT RELEASE COMMAND or PDU SESSION RESOURCE RELEASE COMMAND or PDU SESSION RESOURCE MODIFY REQUEST message sent by AMF to NR CU cell according to 3GPP TS 38.413 [11)) or successful outgoing handover (UE CONTEXT RELEASE over Xn received from the target NG CU cell in case of Xn based handover or UE CONTEXT RELEASE COMMAND message sent by AMF to NR CU cell in case of NG intra/inter-system handover according to 3GPP TS 38.413 [11]) due to normal release cause.

d) Each measurement is an integer value (in milliseconds).

e) The measurement name has the form 5QI1QoSflow.Rel.Average.NormCallDuration.

f) NRCellCU

g) Valid for packet switched traffic

h) 5GS

i) Possible normal release causes according to 3GPP TS 38.413 [11] are the following ones: "Normal Release", "Deregister", "User inactivity", “Release due to CN-detected mobility", "Handover Cancelled", "Partial handover", "Successful handover".

#### 5.1.3.x Average Abnormally Released Call (5QI 1 QoS Flow) Duration

a) This measurement provides the average value of abnormally released call (5QI 1 QoS Flow) duration.

b) CC

c) The measurement is done as an arithmetical average of the samples of normally released calls (5QI 1 QoS Flows) duration at the end of measurement period. Each sample is measured from the point in time the 5QI 1 QoS Flow has been successfully established via initial Context setup procedure (INITIAL CONTEXT SETUP RESPONSE message sent by NR CU cell to AMF according to 3GPP TS 38.413 [11]) or additional 5QI 1 QoS Flow setup procedure (PDU SESSION RESOURCE SETUP RESPONSE or a PDU SESSION RESOURCE MODIFY RESPONSE message sent by NR CU cell to AMF according to 3GPP TS 38.413 [11]) or incoming handover (HANDOVER REQUEST ACKNOWLEDGE sent by target NR CU cell to AMF in case of NG intra/inter-system handover or sent by target to source NR CU cell via Xn in case of Xn based handover according to 3GPP TS 38.413 [11]) till the point in time the 5QI 1 QoS Flow is released via gNB (UE CONTEXT RELEASE REQUEST message sent by NR CU cell to AMF according to 3GPP TS 38.413 [11]) or AMF initiated release procedure (UE CONTEXT RELEASE COMMAND, PDU SESSION RESOURCE RELEASE COMMAND or PDU SESSION RESOURCE MODIFY REQUEST message sent by AMF to NR CU cell according to 3GPP TS 38.413 [11)) due to abnormal release cause.

d) Each measurement is an integer value (in milliseconds).

e) The measurement name has the form 5QI1QoSflow.Rel.Average.AbnormCallDuration.

f) NRCellCU

g) Valid for packet switched traffic

h) 5GS

i) Possible abnormal release causes are given in 3GPP TS 38.413 [11] except for the following causes: "Normal Release", "Deregister", "User inactivity", “Release due to CN-detected mobility", "Handover Cancelled", "Partial handover", "Successful handover".

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| **End of Modified Section** |

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| **2nd Modified Section** |

# A.28 Monitor of QoS flow release

QoS flow is the key and limited resource for 5G RAN (including NG-RAN and non-3GPP access) to deliver services. The release of the QoS flow needs to be monitored as:

- an abnormal release of the QoS flow will cause the call(/session) drop, which directly impacts the QoS delivered by the networks, and the satisfaction degree of the end user;

- a successfully released QoS flow can be used to setup other requested calls(/sessions). The QoS flow failed to be released will still occupy the limited resource and hence it can not be used to admit other requested calls(/sessions).

From a retainability measurement aspect, QoS flows do not need to be released because they are inactive, they can be kept to give fast access when new data arrives.

To define (from a QoS flow release measurement point of view) if a QoS flow is considered active or not, the QoS flow can be divided into two groups:

For QoS flows with bursty flow, a UE is said to be "in session" if any QoS flow data on a Data Radio Bearer (UL or DL) has been transferred during the last 100 ms.   
For QoS flows with continuous flow, the QoS flow (and the UE) is always seen as being "in session" in the context of this measurement, and the session time is increased from the first data transmission on the QoS flow until 100 ms after the last data transmission on the QoS flow.

How to decide for a particular QoS flow if the QoS flow is of type bursty flow or continuous flow is outside the scope of this document.

The specific reason causing the abnormal and failed release of the QoS flow is required in order to find out the problem and ascertain the solutions. And due to different priority and tolerance for different service type with different QoS level in the networks, the monitor needs to be opened on each service type with QoS level.

The QoS flow can be released by PDU Session Resource Release procedure, UE Context Release procedure, Reset procedure either initiated by 5G RAN (including NG-RAN and non-3GPP access) or AMF and NG Path Switch procedure (see 3GPP TS 38.413 [11]).

So performance measurements related to QoS flow Release (see 3GPP TS 38.413 [11]) and UE Context Release (see 3GPP TS 38.413 [11]) procedure for each service type with QoS level are necessary to support the monitor of QoS flow release.

The abnormal release of the QoS flow has potential scenario where, regardless of receiving the UE Context Release Command with the cause related to abnormal release, the end user does not perceive it as abnormal. This scenario is explicitly related to 5QI 1 calls, for other services it is not possible to determine the reason behind the cause code. It is typical to encounter such scenario, a so called "double UE Context", when Radio Link Failure occurs during an ongoing 5QI 1 call and RRC Connection Re-establishment attempt fails on target or other cell. If then the UE does a new RRC Connection the 5QI 1 QoS flow is set-up during Initial Context Setup in the target or other cell. However, when AMF receives that service request with the Initial UE message through the target or other cell, it realizes that it already has the same UE Context but from the source cell (it has not been released yet). In such case, AMF sends UE Context Release Command to the source cell. As the 5QI 1 QoS flow has been successfully setup in the target or other cell, the 5QI 1 QoS flow release in the source cell may not be perceived as a drop (abnormal release) by the end user, as the service has been sustained with some interruption time, and can’t be considered as a drop in the 5QI 1 QoS flow Drop Ratio.

From QoS perspective it is important to focus also on call duration as in some cases wrong quality perceived by the end user is not fully reflected by drop ratio nor retainability KPI. Typical case is when due to poor radio conditions the end user redials (the call was terminated normally) to the same party to secure the quality. But in this case the drop ratio KPI will not show any degradation. Secondly, although the call is dropped the end user may or may not redial depending on dropped call duration compared to the case when the call would be normally released. It is therefore highly recommended to monitor average and distribution of duration of normally and abnormally released calls.

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| **End of Modified Section** |