**3GPP TSG-CT WG1 Meeting #131-eC1-21xxxx**

**E-meeting, 19-27 August 2021 *was* C1-214267**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **24.193** | **CR** | **0054** | **rev** | **1** | **Current version:** | **17.1.0** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | QoS flow recognition for per QoS flow measurements |
|  |  |
| ***Source to WG:*** | ZTE |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | ATSSS\_Ph2 |  | ***Date:*** | 2021-08-23 |
|  |  |  |  |  |
| ***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 clause 5.32.5 of TS 23.501:"… …*When access performance measurements for an SDF are performed based on the target QoS Flow, the UE needs to be able to determine the QoS Flow a downlink packet arrives on. In order to enable this, the SMF shall include downlink Packet Filter information in the QoS rule provided to UE matching this SDF, unless Reflective QoS is used for the SDF.**NOTE 4: For example, if a QoS Flow requires to activate Reflective QoS, the SMF does not need to provide downlink QoS Flow information for the QoS Flow to minimize usage of packet filters. When a data packet is received over a QoS Flow, the UE can decide whether to check the downlink QoS Flow information based on the existence of SDAP header for the QoS Flow.*… …- The UPF applies the same procedure for calculating the DL PLR, *i.e. it sends to UE a PMF-PLR Count Request message on a target QoS Flow to request from UE to start counting the number of DL packets received on this target QoS Flow. As defined in clause 5.32.5.1, the UE determines which DL packets are received on the target QoS Flow by checking the QFI included in the header of DL packets (e.g. in the SDAP header). If no QFI is included in the header of a DL packet, the UE determines the QFI for this DL packet by applying the Packet Filters for downlink in the QoS Rules received from SMF*."It needs to specify corresponding handling of QoS flow recognition for per QoS flow measurements in stage 3. |
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| ***Summary of change:*** | 1. Remove the EN in clause 5.4.1.2. Specify the SMF shall provide the UE with the QoS rules including packet filters containing the UDP port or the MAC address associated with the QoS flow in the MAI to transport the PMFP messages over the target QoS flows.3. Specify the SMF shall provide the UE with the QoS rules including downlink only or bidirectional packet filter matching the SDF to be measured, unless reflective QoS is used for the SDF. |
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| ***Consequences if not approved:*** | QoS flow recognition for per QoS flow measurements is not supported in stage 3. |
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| ***Clauses affected:*** | 2, 5.4.1, 5.4.2.1.3, 5.4.7.1 |
|  |  |
|  | **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:*** |  |

\* \* \* First 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 23.501: "System Architecture for the 5G System; Stage 2".

[3] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[4] 3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[5] 3GPP TS 24.526: "UE policies for 5G System (5GS); Stage 3".

[6] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[7] 3GPP TS 24.502: "Access to the 3GPP 5G System (5GS) via non-3GPP access networks; Stage 3".

[8] IETF RFC 8684: "TCP Extensions for Multipath Operation with Multiple Addresses".

[9] IETF RFC 8803: "0-RTT TCP Convert Protocol".

[10] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[11] IEEE Std 802-2014: "IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture".

[12] IEEE 802.3-2018: "IEEE Standard for Ethernet".

[13] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[14] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[xx] 3GPP TS 37.342: "E-UTRA and NR; Service Data Adaptation Protocol (SDAP) specification".

[yy] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane Nodes; Stage 3".

\* \* \* Next Change \* \* \* \*

### 5.4.1 General

Performance measurement function protocol (PMFP) procedures are performed between a performance measurement function (PMF) in a UE and a PMF in the UPF.

The following UE-initiated PMFP procedures are specified:

a) UE-initiated RTT measurement procedure; and

b) access availability or unavailability report procedure;

c) UE-initiated PLR measurement procedure; and

d) UE assistance data provisioning procedure.

The following UPF-initiated PMFP procedures are specified:

a) UPF-initiated RTT measurement procedure; and

b) UPF-initiated PLR measurement procedure.

The UE-initiated PMFP procedures and the UPF-initiated PMFP procedures can be performed in an MA PDU session only when the MAI is provided to the UE during establishment of the MA PDU session.

PMFP messages are transported in an IP packet or an Ethernet frame according to clause 5.3.2.

If the UE receives the MAI which indicates that the performance measurement is for the QoS flow(s) of the non-default QoS rule, the UE performs the RTT measurement procedure or the PLR measurement procedure over the QoS flow(s) of the non-default QoS rule as indicated in the received MAI. Otherwise, the UE performs the RTT measurement procedure or the PLR measurement procedure over the QoS flow of the default QoS rule.

If the UPF receives the indication from the SMF that the performance measurement is for QoS flow(s) of the non-default QoS rule, the UPF perfroms the RTT measurement procedure or the PLR measurement procedure over the QoS flow(s) of non-default QoS rule as indicated by the SMF. Otherwise, the UPF performs the RTT measurement procedure or the PLR measurement procedure over the QoS flow of the default QoS rule.

PMFP messages, transported between the UE and the UPF over one or more QoS flows of the non-default QoS rule, are specified in clause 5.4.2.1.3.

Editor's Note: It is FFS how the UE and the UPF negotiate the capability of performance measurement over the QoS flow of the non-default QoS rule. The corresponding indication from SMF to the UPF will be defined by CT4.

PMFP messages transported between the UE and the UPF (and vice versa) are protected using the security mechanisms protecting the user data packets transported over NG-RAN or non-3GPP access connected to the 5GCN and over the N3 and N9 reference points, specified in 3GPP TS 33.501 [14]. A PMFP-specific security mechanism is not specified.

NOTE: Even though transport of PMFP messages between the UE and the UPF is protected, a compromised UE can send false or incorrect PMFP messages.

PMFP is a standard L3 protocol according to 3GPP TS 24.007 [13], PMFP messages are standard L3 messages according to 3GPP TS 24.007 [13] and error behaviour specified for L3 protocol in according to 3GPP TS 24.007 [13] applies for PMFP.

The access availability or unavailability report procedure is performed over the QoS flow of the default QoS rule.

\* \* \* Next Change \* \* \* \*

##### 5.4.2.1.3 PMFP message transport associated with QoS flow

In this release of specification, RTT measurement procedure and PLR measurement procedure can be performed per QoS flow.

In order to transport PMFP ECHO REQUEST message, PMFP ECHO RESPONSE message, PMFP PLR COUNT REQUEST message, PMFP PLR COUNT RESPONSE message, PMFP PLR REPORT REQUEST message and PMFP PLR REPORT RESPONSE message over the specific QoS flows, SMF shall provide the UE with the QoS rules including the packet filters containing the UDP port or the MAC address associated with the QoS flow in the MAI.

NOTE: The SMF providing the UPF with the UL PDR including the UDP port or the MAC address associated with a QoS flow is specified in 3GPP TS 29.244 [yy].

\* \* \* Next Change \* \* \* \*

#### 5.4.7.1 General

The purpose of the network-initiated PLR measurement procedure is to enable the UPF to measure the PLR of DL traffic to the UPF over an access of an MA PDU session.

The network-initiated PLR measurement procedure can be performed over an access of an MA PDU session only when there is user-plane resources on the access of the MA PDU session. The network-initiated PLR measurement procedure can be performed for the QoS flow of the default QoS rule or the QoS flow of the non-default QoS rule. In the latter case, the SMF shall provide the UE with the QoS rules including downlink only or bidirectional packet filter matching the SDF to be measured, unless reflective QoS is used for the SDF during the PDU session establishment procedure or PDU session modification procedure as specified in 3GPP TS 24.501 [6].

The network-initiated PLR measurement procedure consists of following two procedures:

a) network-initiated PLR count procedure (see clause 5.4.7.2); and

b) network-initiated PLR report procedure (see clause 5.4.7.3).

The network shall not initiate another PLR measurement procedure over the same QoS flow until current network-initiated PLR measurement procedure is completed.

An example of network-initiated PLR measurement procedure which consists of the two procedures is shown in figure 5.4.7.1-1.



Figure 5.4.7.1-1: Network-initiated PLR measurement procedure

1. The UPF sends a PMFP PLR count request message to the UE. If the network-initiated PLR measurement is to meaure the PLR of the SDF over a QoS flow of the non-default QoS rule, the PMFP PLR count request message is transported over the QoS flow of the non-default QoS rule. Otherwise, the PMFP PLR count request message is transported over the QoS flow of the default QoS rule.

NOTE: In the network-initiated PLR measurement procedure, all the PMFP messages are transported over the same QoS flow on the same access of the MA PDU session.

2. Upon sending the PMFP PLR count request message, the UPF starts counting the transmitted DL packets over the QoS flow.

3-4. Upon receiving the PMFP PLR count request message, the UE starts counting the received DL packets over the QoS flow which the PMFP PLR count request message is received from and sends the PMFP PLR count response message to the UPF. In order to determine the QFI the counted DL packet is associated with, the UE:

- learns the QFI from the header of the received DL packet (e.g. in the SDAP header as specified in 3GPP TS 37.324 [xx]); or

- map the DL packet to the QFI by evaluating the QoS rules for downlink only or bidirectional packet filter(s) if no QFI is included in the header of the received DL packet.

5-6. The UPF sends a PMFP PLR report request message to request the UE to report the number of the counted DL packets. If the UPF intends to request the UE to restart counting the DL packets, the UPF can include an indication in the PMFP PLR report request message and restart counting the transmitted DL packets over the QoS flow.

Editor's note: Error handling on UPF side is FFS if the UPF fails to receive the acknowledgement of restarting counting the DL packets from the UE.

7-9. Upon receiving the PMFP PLR report request message, the UE stops counting the DL packets and sends PMFP PLR report response message which includes the number of the DL packets counted since the reception of the last PMFP PLR count request message. If an indication to request restart of counting procedure is received and accepted by the UE, the UE restarts counting the received DL packets.

10. The UPF calculates the DL packet loss rate based on the local counting result of the number of transmitted DL packets and the reported number of received DL packets included in the PMFP PLR report response message.

\* \* \* End of Changes \* \* \* \*