**3GPP TSG- Meeting # *S5-243273***

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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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 |  | Core Network | **X** |

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| ***Title:***  |  |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** | S5 |
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| ***Work item code:*** |  |  | ***Date:*** |  |
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| ***Category:*** |  |  | ***Release:*** |  |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | The UPF supports Performance Measurement Functionality (PMF), which may be used to obtain access performance measurements such as RTT. The purpose of the UPF-initiated RTT measurement procedure is to enable the UPF to measure the RTT of an exchange of user data packets between the UPF and the UE over an access of an MA PDU session. Therefore, it is useful to get to know the performance of PMF by making some measurements. |
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| ***Summary of change:*** | Add PMF related measurement：- Number of requested/successful/failed RTT measurements iniciated by UPF |
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| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** | 2, 3.2, 5.4.X(new), A.Y(new) |
|  |  |
|  | **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:*** | Revision of S5-242781. |

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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".

[35] 3GPP TS 38.133: "NR; Requirements for support of radio resource management".

[36] 3GPP TS 33.501: "Security architecture and procedures for 5G system".

[37] 3GPP TS 38.304: "NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state".

[38] 3GPP TS 28.530: "Management and orchestration; Concepts, use cases and requirements".

[39] 3GPP TS 29.507: "5G System; Access and Mobility Policy Control Service; Stage 3".

[40] 3GPP TS 29.512: "5G System; Session Management Policy Control Service; Stage 3".

[41] 3GPP TS 29.531: "5G System; Network Slice Selection Services".

[42] 3GPP TS 29.281: "General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)".

[43] 3GPP TS 29.540: "5G System; SMS Services; Stage 3".

[44] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage 3".

[45] 3GPP TS 29.541: "5G System; Network Exposure FunctionServices for Non-IP Data Delivery (NIDD); Stage 3".

[46] 3GPP TS 23.503: "Policy and charging control framework for the 5G System (5GS); Stage 2".

[47] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[48] 3GPP TS 29.554: "5G System; Background Data Transfer Policy Control Service; Stage 3".

[49] 3GPP TS 38.300: "NR and NG-RAN Overall description; Stage-2".

[50] 3GPP TS 28.538: "Management and orchestration; Edge Computing Management".

[51] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[52] 3GPP TS 23.558: "Architecture for enabling Edge Applications".

[53] 3GPP TS 23.273: "5G System (5GS); Location Services (LCS); Stage 2".

[54] 3GPP TS 29.572: "5G System (5GS); Location Management Services; Stage 3".

[55] Void

[56] 3GPP TS 38.425: "NG-RAN; NR User plane protocol".

[57] 3GPP TS 36.425: "(E-UTRAN); X2 interface user plane protocol".

[58] 3GPP TS 29.520: "5G System; Network Data Analytics Services; Stage 3".

[59] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[60] 3GPP TS 37.340: "NR; Multi-connectivity; Overall description; Stage-2".

[61] 3GPP TS 38.321: "NR; Medium Access Control (MAC) protocol specification".

[X] 3GPP TS 24.193: "Access Traffic Steering, Switching and Splitting (ATSSS); Stage 3".

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| **2nd 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

PMF Performance Measurement Function

SA PDU Single-Access PDU

SN Secondary Node.

SRS Sounding Reference Signal

TEID Tunnel Endpoint IDentifier

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| **3rd change** |

## 5.4 Performance measurements for UPF

### 5.4.X PMF related measurements

##### 5.4.X.1 Number of RTT measurement requests (network-initiated procedure)

a) This measurement provides the number of RTT measurement requests over the access of the MA PDU session (procedure initiated by UPF).

b) CC.

c) On transmission of PMFP ECHO REQUEST message from the UPF to UE in the duration of a T201 timer (see TS 24.193 [X] clause 5.4).

d) A single integer value. Multiple requests are counted as one in the duration of each T201 timer.

e) GTP.RTTMeasUpfInitReq.

f) EP\_N3 (contained by UPFFunction);
EP\_N9 (contained by UPFFunction).

g) Valid for packet switched traffic.

h) 5GS.

##### 5.4.X.2 Number of RTT measurement responses (network-initiated procedure)

a) This measurement provides the number of RTT measurement responses over the access of the MA PDU session (procedure initiated by UPF).

b) CC.

c) On receipt of PMFP ECHO RESPONSE message with the same EPTI as the allocated EPTI value and with the RI value of a sent PMFP ECHO REQUEST message (see TS 24.193 [X] clause 5.4) by the UPF from UE.

d) A single integer value. Multiple response are counted as one in the duration of each T201 timer.

e) GTP.RTTMeasUpfInitSucc.

f) EP\_N3 (contained by UPFFunction);
EP\_N9 (contained by UPFFunction).

g) Valid for packet switched traffic.

h) 5GS.

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| **4th change** |

A.Y Use case of measurements related to ATSSS rules

The ATSSS feature enables a multi-access PDU Connectivity Service, which can exchange PDUs between the UE and a data network by simultaneously using one 3GPP access network and one non-3GPP access network and two independent N3/N9 tunnels between the PSA and RAN/AN.

ATSSS rules/N4 rules are applied by UE/UPF for deciding how to distribute the downlink/uplink traffic across the two access networks. The PMF protocol enables messages to be exchanged between the PMF in the UE and the PMF in the UPF, e.g. RTT measurements for ATSSS-LL control, reporting of access availability/unavailability, PLR measurements for ATSSS-LL, etc.

The RTT measurements are defined to support several steering modes such as "Smallest Delay", "Load Balancing", "Priority-based" and "Redundant". The number of RTT measurements requests and responses will reflect whether the RTT values is available. These measurements provide reference to help operators to identify whether the steering mode in the ATSSS rules is implemented as expected.

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| **End of change** |