**3GPP TSG- Meeting #**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **1** | **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:*** | | | 5 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | To support XR services (AR/VR applications) and interactive media services that require high data rate and low latency communication, a PDU set is introduced, which is comprised of one or more PDUs carrying an application layer payload such as a video frame or video slice. The XR service requires the transmission delay of the PDU Set to be within the PDU Set Delay Budget (PSDB). Therefore, it is necessary to add the measurement of average DL PDU set delay for XR service. | | | | | | | | |
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| ***Summary of change:*** | | Add XR service related measurements：  - average DL PDU set delay between NG-RAN and PSA UPF | | | | | | | | |
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| ***Consequences if not approved:*** | | Cannot monitor average DL PDU set delay for XR measurement. | | | | | | | | |
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| ***Clauses affected:*** | | 3.2, 5.4.X(new), A.X(new) | | | | | | | | |
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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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| **Start of changes** |

## 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

EN-DC E-UTRA-NR Dual Connectivity

GP Guard Period

HO Handover

ITI Interrupted Transmission Indication

kbit kilobit (1000 bits)

KPI Key Performance Indicator

LHO Legacy Handover

LTM L1/L2 Triggered Mobility

MA PDU Multi-Access PDU

MN Master Node.

MPQUIC Multi-Path QUIC

MPTCP Multi-Path TCP Protocol

NE-DC NR-E-UTRA Dual Connectivity

NGEN-DC NG-RAN E-UTRA-NR Dual Connectivity

NG-RAN Next Generation Radio Access Network

RNA RAN-based Notification Area

PI Performance Indicator

PLR Packet Loss Rate

PMF Performance Measurement Function

PSSN PDU Set Sequence Number

SA PDU Single-Access PDU

SDT Small Data Transmission

SN Secondary Node.

SRS Sounding Reference Signal

TEID Tunnel Endpoint IDentifier

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| **next change** |

### 5.4.X PDU set delay

##### 5.4.X.1 average DL PDU set delay between NG-RAN and PSA UPF

a) This measurement provides the average DL PDU set delay between NG-RAN(N3) and PSA UPF(N6).

b) DER (n=1).

c) The measurement is obtained by the following method:

For each PDU set (PDU Set Sequence Number , see 38.415 [31]), the UPF records the following time stamps and information (see 29.281 [42], 23.501 [4]):

- T1 is the time stamp when the PSA UPF received the first PDU of a PDU set () at the N6 termination point;

- T2 is obtained by *DL sending time stamp* IE in UL PDU SESSION INFORMATION message (see 38.415 [31]) sent from NG-RAN to UPF when the last DL PDU of the PDU set () have been successfully received by NG-RAN at the N3 termination point;

The UPF counts the successfully received number (N) of PDU sets and takes the following calculation:

d) Each measurement is a real representing the average delay in microseconds.

e) The measurement name has the form PDUSet.DelayDlUpfNgranMean

f) UPFFunction.

g) Valid for packet switched traffic.

h) 5GS.

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| **next change** |

# A.X Use case of monitoring of PDU sets management for XR

eXtended Reality (XR) service is considered as one of the key candidate services in 5GA and 6G networks. To support XR services, PDU Set is defined (see TS 26.522 clause 3.1), i.e. one or more PDUs carrying the payload of one unit of information generated at the application level (e.g. frame(s), video slice(s), metadata, etc.).

The PDU Set based QoS handling by the 5G-AN is determined by PDU Set QoS Parameters, such as PDU Set Delay Budget (PSDB), PDU Set Error Rate (PSER), etc., which can be used by the 5G-AN to support the configuration of scheduling and link layer functions.

The DL PSDB applies to the DL PDU Set received by the PSA UPF. To enable support for PSDB, it is required that a maximum inter arrival time between the first received PDU and the last received PDU of a PDU Set complies with SLA. It is therefore necessary to monitor whether the DL PDU set delay exceeds the PSDB is necessary to support the network with frame scheduling and guarantees.

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| **End of changes** |