**3GPP TSG-SA5 Meeting #144e S5-224131rev2**

**e-meeting 27 June - 1 July 2022**

**Source: China Unicom, CATT**

**Title: Add solution for URLLC performance measurements related to latency**

**Document for: Approval**

**Agenda Item: 6.8.3 Study on Management Aspects of URLLC**

# 1 Decision/action requested

***The group is asked to approve the proposal.***

# 2 References

[1] 3GPP TR 28.832 v0.2.0: “Management Aspects of URLLC”

# 3 Rationale

It was approved in SP-220146 to study the management aspects of URLLC and one of the objectives is to investigate performance measurements related to URLLC. In order to achieve the objective mentioned above, some performance measurements related to URLLC is proposed in this contribution.

# 4 Detailed proposal

This contribution proposes to make the following changes in [1].

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| **1st Change** |

# 5 Key Issues Investigation and Potential Solutions

## 5.X Key Issue #X: Performance measurements related to URLLC

### 5.X.1 Description

5.X.2 Potential solutionsIn order to satisfy the requirement for performance management of network providing URLLC service, new measurements should be investigated and defined to evaluate the reliability and latency performance of network providing URLLC service.

5.X.2.1 Downlink average latency for late packets

a) This measurement prvides the average (arithmetic mean) delay of the packets which are received with the latency more than time constraint on downlink transmission containing the air-interface between gNB and UE for the radio network providing URLLC service. The measurement is calculated per PLMN ID and per 5QI level and per supported S-NSSAI.

b) DER (n=1).

c) This measurement is obtained as: 1) calculating the DL latency for RLC SDU packets by: point in time when the last part of an RLC SDU packet was sent to the UE which was consequently confirmed by reception of HARQ ACK for UM mode or point in time when the last part of an RLC SDU packet was sent to the UE which was consequently confirmed by reception of RLC ACK for AM mode, minus the time when corresponding RLC SDU part arriving at MAC layer. If the DL latency for a packet is more than time constraint TC the packet is a late packts; 2) sum of (latency of late packets) divided by the number of late packets is the result of the measurement. The measurement is performed per PLMN ID and per 5QI and per supported S-NSSAI.d) Each measurement is a real value representing the average latency for late packets. The number of measurements is equal to the number of PLMNs multiplied by the number of QoS levels or multiplied by the number of S-NSSAIs.

e) DRB.LatencyDlgNBUu.TC\_Filter,

where filter is a combination of PLMN ID and QoS level and S-NSSAI.

 Where TC indicates the time constraint.

NOTE1: TC canbe set according to AN PDB of 5QI, or canbe obtained according to attribute of SLAof a slice, or can be pre-configured by OAM.

NOTE2: Table 5.7.4-1 in TS 23.501 defines the key characteristics of 5QI in 5G network and the service examples for delay critical GBRs matches the use cases of URLLC servcie.

f) NRCellDU

g) Valid for packet switched traffic.

h) 5GS.

i) One usage of this measurement is for performance management of the network providing URLLC service on delay area.

5.X.2.2 Uplink average latency for late packets

a) This measurement prvides the average (arithmetic mean) delay of the packets which are transmitted with the latency more than time constraint on uplink transmission containing the air-interface between gNB and UE for the radio network providing URLLC service. The measurement is calculated per PLMN ID and per 5QI level and per supported S-NSSAI.

b) DER (n=1).

c) This measurement is obtained as: 1) calculating the UL latency for MAC SDU packets by: point in time when the corresponding UL MAC SDU is successfully sent to RLC in gNB, minus the time when an UL MAC SDU is scheduled in MAC layer in UE as per the scheduling grant provided. If the UL latency for a packet is more than time constraint TC the packet is a late packts; 2) sum of (latency of late packets) divided by the number of late packets is the result of the measurement. The measurement is performed per PLMN ID and per 5QI and per supported S-NSSAI.

d) Each measurement is a real value representing the average latency for late packets. The number of measurements is equal to the number of PLMNs multiplied by the number of QoS levels or multiplied by the number of S-NSSAIs.

e) DRB.LatencyUlgNBUu.TC\_Filter,

where filter is a combination of PLMN ID and QoS level and S-NSSAI.

 Where TC indicates the time constraint.

NOTE1: TC canbe set according to AN PDB of 5QI, or canbe obtained according to attribute of SLA of a slice, or can be pre-configured by OAM.

NOTE2: Table 5.7.4-1 in TS 23.501 defines the key characteristics of 5QI in 5G network and the service examples for delay critical GBRs matches the use cases of URLLC servcie.

f) NRCellDU

g) Valid for packet switched traffic.

h) 5GS.

i) One usage of this measurement is for performance management of the network providing URLLC service on delay area.

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| **End of changes** |