**3GPP TSG SA WG4 #132 S4-250780**

**Fukuoa, May 19-23, 2025**

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| *CR-Form-v12.0* |
| **PSEUDO CHANGE REQUEST** |
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|  | **26.830** | **CR** | pseudo | **rev** | **-** | **Current version:** | **0.4.0** |  |
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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 |  | Radio Access Network |  | Core Network |  |

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| ***Title:***  | **[FS\_iRTCW\_Ph2] On the support of tethered cases in RTC system** |
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| ***Source to WG:*** | Qualcomm Incorporated |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | FS\_iRTCW\_Ph2 |  | ***Date:*** | 05/12/2025 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19  |
|  | *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-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)* *Rel-17 (Release 17)* *Rel-18 (Release 18)* |
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| ***Reason for change:*** | There is not sufficient background information about key issue #3 in clause 5.4. Solution #3 is not complete. |
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| ***Summary of change:*** | Detailed justifications are added to clause 5.4. Solution #3 is developed in clause 6.4.Added the corresponding parts for clauses 7 and 8. |
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| ***Consequences if not approved:*** | The key issue #3 was not concluded. |
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| ***Clauses affected:*** |  |
|  |  |
|  | **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:*** |  |

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#  Proposed changes

Add the following to the References.

\* \* \* \* 1st change \* \* \* \*

[17] 3GPP TS 26.522: "5G Real-time Media Transport Protocol Configurations".

\* \* \* \* 2nd change \* \* \* \*

5.4 Key Issue #3: Support of tethered cases in RTC system

5.4.1 Description

The support for tethered cases in the RTC architecture was studied and documented in 3GPP TR 26.930 [15]. This key issue can be decomposed into three key issues that potentially need to be studied further:

3-1. Identification of the supported scenario for tethered cases. (e.g., "Native WebRTC App/Web App" on the tethered device and "Native WebRTC App/Web App" on the UE.)

 Solution #9-2 in 3GPP TR26.930 included three scenarios on where the WebRTC Endpoint resides between the tethering device and the tethered device. This key issue #3-1 is to study if there are additional scenarios that need to be considered.

3-2. Media processing capabilities of the tethered devices and the impact on the RTC architecture.

 3GPP TS 26.119 [4] documented the media processing capabilities for the tethered devices. This key issue #3-2 is included here to study whether the media processing capabilities in 3GPP TS 26.119 are sufficient for supporting tethering in WebRTC.

3-3. Evaluate the SA2 solution in 3GPP TS 23.501 [16] and XRM\_Ph2 in Release-19 on E2E QoS when there are non-3GPP networks also involved for the use cases considered under SA4 and identify potential gaps and coordinate with SA2 if needed.

 3GPP TR 26.806 [6] studied end-to-end QoS for the cases involving a tethering link. It is beneficial to compare the solutions in 3GPP TR 26.806 [6] to the SA2 solution in 3GPP TS 23.501 [16].

\* \* \* \* 3rd change \* \* \* \*

6.4 Solution #3: Support of tethered cases in RTC system

6.4.1 Solution description

The following solutions addresses the key issues under key issue #3.

6.4.2 Solution #3-1

The outcome of the study documented in 3GPP TR 26.930 [15] is sufficient in addressing key issue #3-1. In this study, no further scenario is found

 6.4.3 Solution #3-2

In 3GPP TS 26.119 [4], the thin AR glasses device type is defined, and it can be mapped to the tethered device that is described in the architecture in Solution #9-2-3 in 3GPP TR 26.930 [15]. The media processing capabilities specified in 3GPP TS 26.119 [4] that are applicable to the thin AR glasses device type can be applied to the tethered device. There is no need to define new media processing capabilities for the tethered device.

6.4.3 Solution #3-3

Here the SA2 solution is first summariezed in clause 6.4.3.1. Potential alternatives to reporting the delay budget for the non-3GPP is considered in clause 6.4.3.2. An existing SA4 solution that could overcome some of the limitations of the SA2 solution is described in clause 6.4.3.3. The solution refers to the architecture in Solution #9-2-3 in 3GPP TR 26.930 [15].

6.4.3.1 Delay compensation for one non-3GPP link

Clause 5.44.3.4 of TS 23.501 [5] provided a solution to take into account the delay of a non-3GPP link in an end-to-end path in the context of Personal IoT Network (PIN). The non-3GPP link is between the PINE (PIN Element) and the PEGC (PIN Element with Gateway Capability), where the PINE maps to the tethered device, the PEGC maps to the UE, and the non-3GPP link maps to the tethering link here. The PEGC provides a delay budget for the non-3GPP link to the SMF through a PDU Session Modification procedure requested by the PEGC, and the SMF adds the non-3GPP delay budget to the core network delay budget (CN PDB) subsequently signaled to the RAN, which derives the access network delay budget (AN PDB) accordingly that compensates the non-3GPP delay.

6.4.3.2 Tethering link delay reporting

Instead of reporting a non-3GPP delay budget, the UE may report a measured non-3GPP delay.

Clause 6.3 of 3GPP TR 26.806 [6] gives a solution that reports the tethering link delay as an event in the Event Exposure (EVEX) framework in 3GPP TS 26.531 [5].

Alternatively, the tethering link delay may be reported as a QoE metric. 3GPP TR 26.812 [7] includes the round-trip time (RTT) and one-way delays as QoE metrics. The tethering link delay contributes to the RTT and one-way delays, and the knowledge of the tethering link delay may help optimize the communication system. Thus, it is beneficial to include the tethering link delay as a QoE metric. The current QoE measurement and reporting mechanisms in 3GPP TS 28.405 [8] can be used for the reporting.

6.4.3.3 Delay compensation for multiple non-3GPP links

There may be multiple non-3GPP links on an end-to-end path. Measuring and reporting the non-3GPP delays individually may be problematic. For example, consider the scenario where a pair of AR glasses is connected via Wi-Fi to a UE, which is connected to a RAN, which is connected to a UPF, which is connected to the Internet, which is connected to a cloud server. This end-to-end path has two non-3GPP links: a Wi-Fi link, and an Internet path. To measure the delay between the UPF and the cloud server, the UPF may initiate the transmission of a measurement packet destined to the cloud server, but the application server may not know the measurement packet is from a legitimate source and therefore block it. Alternatively, the cloud server may initiate the transmission of a measurement packet destinted to the UPF, but this requires the IP address of the UPF to be made known to the cloud server, which poses a security issue for the UPF.

Clause 6.1.2.1 of 3GPP TR 26.806 [6] describes a solution to derive the aggregate non-3GPP delay over all non-3GPP links on an end-to-end path. A UE only needs to report the end-to-end delay to the 5G system which then subtracts the delay in the 5G network from the end-to-end delay to get the aggregate non-3GPP delay. Once the aggregate non-3GPP delay is derived, the 5G system can compensate for it. The solution is simple and easy to implement.

To increase the accuracy of end-to-end delay measurement, 3GPP TS 26.522 [17] specifies RTP header extensions for in-band end-to-end delay measurement.

The solution in clause 6.1.2.1 of 3GPP TR 26.806 [6] is sufficient for providing desired end-to-end delay for an end-to-end path including non-3GPP links, and no gaps are identified.

\* \* \* \* 4th change \* \* \* \*

7 Overall Analysis

7.1 General

7.1.3 Key issue #3

This key issue is addressed by Solution #3. Additional scenarios beyond Solution #9-2-3 in 3GPP TR 26.930 [15] were looked for but not found. The media processing capabilities defined in 3GPP TS 26.119 [4] are sufficient for the tethered architecture described in Solution #9-2-3 in 3GPP TR 26.930 [15]. The SA2 solution (clause in 5.44.3.4 of TS 23.501 [5]) for handling non-3GPP delays on the end-to-end path is analyzed and compared to the SA4 solution (Clause 6.1.2.1 of 3GPP TR 26.806 [6]), a new tethering link delay reporting method (as part of the QoE metrics reporting) is discussed, and the potential gaps in the SA2 solution can be addressed by existing solutions.

8 Conclusions

8.1 General

8.1.3 Key issue #3

This key issue is studied and there appears no need to do normative work in SA4 or coordinate with SA2 for potential normative work in SA2.