**3GPP TSG SA WG4 RTC SWG 129 S4-241436**

**e-Meeting, 19 – 23 August, 2024 Revision of S4-241371**

**Source: Samsung Electronics CO., LTD, NTT, AT&T, LG Electronics Inc.**

**Title: SID on immersive Real-Time Communication for WebRTC, Phase 2**

**Document for: Approval**

**Agenda Item: 17**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: Study on immersive Real-Time Communication for WebRTC, Phase 2

Acronym: FS\_iRTCW\_Ph2

Unique identifier:

Potential target Release: Rel-19

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X |  | X |  |
| No | X |  | X |  | X |
| Don't know |  |  |  |  |  |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
| X | Study  |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
|  | Normative – Stage 3 |
|  | Normative – Other\* |

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| GA4RTAR | S4 | 960044 | Generic architecture for RT and AR/MR media |
| iRTCW | S4 | 950014 | immersive Real-Time Communication for WebRTC |
| FS\_eiRTCW | S4 | 950012 | Feasibility Study on the enhancements for immersive Real-time Communication for WebRTC |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 960046 | Real-time Transport Protocols Configurations (5G\_RTP) | Media transport aspects and RTP profile for WebRTC. |
| 1030007 | Study of 5G Real-time Transport Protocol Configurations, Phase 2 | Media transport aspects and RTP profile for WebRTC. |
| 1030006 | Study on Advanced Media Delivery (FS\_AMD) | Further harmonization of RTC and Streaming for Advanced Media Delivery |
| 950015 | Media Capabilities for Augmented Reality (MeCAR) | Signalling and metadata for immersive media communication specified |
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# 3 Justification

In Release-18, SA4 addressed the work for specifying the initial set of 5G generic architecture and the protocols used for WebRTC-based Real-Time media Communication (RTC). The purpose of the work is to support WebRTC-based real-time media communication services (especially for immersive services) in different collaboration models between 5GS operators and third-party media communication service providers. As a result of the work, (a) TS 26.506 specifies RTC architecture, functionalities and call flows required for collaboration scenarios and (b) TS 26.113 specifies the protocols applicable over the interfaces of the RTC architecture.

In addition, SA4 had studied the possible enhancement of RTC architecture and its associated signalling protocols (FS\_eiRTCW, UID=950012) for some specific collaboration scenarios. FS\_eiRTCW did not provide any recommendation for normative works, but it contains some useful key findings to be considered as improved/extended RTC features in Release-19 timeframe.

NOTE: The scope of this study is in the RTC architecture which is non-IMS based, therefore the works of NG\_RTC\_Ph2 in SA2 to enhance IMS network are not relevant to this study.

To better support the immersive media communication over RTC for various service scenarios, the following number of key issues should be investigated further:

**1. Media capabilities, profiles and codecs for RTC.**
The parent work item, iRTCW (UID=950014) was intended to specify the immersive media components, but TS 26.113 primarily specifies the protocols and APIs for real-time communication, which are not restricted to specific profiles nor codecs. TS 26.119 has developed the immersive media codecs and profiles in Release-18 for generic service, it should be studied the suitable subset for real-time media communication in this study.

**2. Signalling and metadata to support immersive media capabilities**
TS 26.113 specified reference point of RTC-4s and RTC-4m for exchange of signalling and metadata information, respectively, However there needs more studies to improve the usage of these interfaces. Particularly, the device type and media capabilities identifiers specifically for UEs with immersive media capabilities are defined in TS 26.119, but 26.113 did not specify how these identifiers could be incorporated into RTC system. Also, 26.113 addressed some essential metadata (e.g,. depth sensors) in the Annex, but it remains as FFS how to make this usable. In this study, the requirements and the potential list of signalling and metadata are identified.

**3. Enhancements of RTC architecture variant for collaboration scenario 3.**TS 26.506 had specified the basic architecture for collaboration scenario 3, where all the required functional entities are located in the trusted DN. Then, it was further studied in Release-18 study (FS\_eiRTCW) to improve utility of RTC AS for RTC application providers and support of Web browser type applications, as provided in TR 26.930. As these enhanced features have potential impacts on the information exposed in the reference points in the existing RTC architecture (e.g., adding new APIs exposed to content providers), it is worthwhile to investigate the followings in this study, particularly:

- The key findings for supporting service control API exposed to RTC application providers and its API specification were provided in clause 5.6 of TR 26.930, based on the derivative RTC architecture for collaboration scenario 3 defined in TS 26.506. However, the gap analysis between the service control APIs and existing APIs over RTC-1 is necessary for identifying how to implement the service control APIs into the latest version of the RTC architecture, considering harmonization with Generalized Media Delivery architecture.

- WebRTC signalling function (WSF) discovery mechanisms using MSH have been specified during Release-18. However, this mechanism is not applicable to Web App (i.e., Java application on a web browser). Then a WSF discovery mechanism applicable to Web App was studied and documented in clause 6.7 of TR 26.930. This mechanism is applicable to collaboration scenario 3 and has potential benefit in some use case (e.g., a UE can find an appropriate WSF among multiple WSFs in a single operator domain), but these use case(s) has not been documented in TR 26.930. Then it is encouraged to study and document the use case(s) of this mechanism.

- The detailed API specification for RTC-3 reference point had not specified in Rel-18. However, the API specification for RTC-3 is useful if the WebRTC Signalling Function and RTC AF are not co-located. Then it is encouraged to study and document the API specification for RTC-3.

**4. Empty RTC architecture variant for collaboration scenario 4.**While TS 26.506 identified four collaboration scenarios depending on the required functional entities in trusted DN, the details of collaboration scenario 4 (Inter-operable WebRTC services over multiple MNOs) was not specified due to less priority in Release-18. The details of collaboration scenario 4 was studied in FS\_eiRTCW in Release-18. As a result of the study, TR 26.930 has provided the potential derivative RTC architecture for collaboration scenario 4. However, procedures and call flows such as these specified in TS 26.506 for collaboration scenario 4 were not studied and documented in TR 26.930.
It is encouraged to identify the possible remaining study (e.g., procedures and call flows for collaboration scenario 4) and the possible coordination with other WGs to confirm the technical feasibility of the proposed derivative RTC architecture variant for collaboration scenario 4. (e.g., whether and how coordinate with other WGs for each technical aspects of the potential solutions).

**5. Feasibility of RESPECT onto collaboration scenario 4.**
TS 26.113 specification in Release-18 specified the signalling protocol for collaboration scenario 3 (single operator scenario) but did not specify the signalling protocol which supports collaboration scenario 4 (supporting inter-MNO connection). TR 26.930 provides the WebRTC signalling protocol, RESPECT (REaltime&REality media Setup Protocol, Extensible and CompacT) which was motivated to support collaboration scenario 4 with Web-based technology by accommodating the extended features in RTC architecture. To complete the RTC-based service, it is required to study the feasibility of RESPECT, documented in TR 26.930, onto collaboration scenarios, which is empty in Release-18, within the scope of SA4 capability and study possible collaboration with other WGs.
It is encouraged to identify the possible remaining study (e.g., missing features of the protocol) and possible coordination with other WGs to confirm the technical feasibility of RESPECT (e.g., whether and how to coordinate with other WGs for each technical aspects of the potential solutions).

**6. Support of tethered cases in RTC system.**
How to support tethered cases on RTC architecture was studied and documented in TR 26.930. Tethered case is one of the possible use cases of immersive RTC services, but the solutions were not completed during the Release-18 study, particularly for following aspects:

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.)

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

3. Evaluate the SA2 solution in TS 23.501 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.

# 4 Objective

This study item aims to:

A. Document the following key issues in detail, and in particular how they relate to the existing RTC architecture and protocols specified in TS 26.506 and TS 26.113:

1. Media capabilities, profiles and codecs for RTC

2. Signalling and metadata to support immersive media capabilities

3. Enhancements of RTC architecture variant for collaboration scenario 3

4. Empty RTC architecture variant for collaboration scenario 4

5. Feasibility of RESPECT onto collaboration scenario 4

6. Support of tethered cases in RTC system

B. Identify solutions for each of the key issues

C. Identify suitable one for key issues requiring solutions and recommend potential normative work to relevant specifications.

NOTE: Item 3, 4, and 5 which have the potential dependency with SA2 in architectural perspectives, thus the solutions of these items need to consider feedback from SA2, if received.

# 5 Expected Output and Time scale

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| --- |
| New specifications {One line per specification. Create/delete lines as needed} |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
| TR | 26.8xx | Enhancements on Real-Time Media Communication for WebRTC | SA#107 (Mar., 2025) | SA#108 (Jun., 2025) | TR Editor: Yoshihiro INOUE (Yoshihiro.inoue@ntt-at.co.jp) |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
|  |  |  |  |
|  |  |  |  |

# 6 Work item Rapporteur(s)

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# 7 Work item leadership

SA4

# 8 Aspects that involve other WGs

Coordination with following WGs is necessary.

- SA2: Architectural aspects related to inter-operator aspects.

- CT1 and CT3: Signalling protocol aspects, network-to-network interface aspects.

- Possibly SA3-LI: Lawful interception aspects.

# 9 Supporting Individual Members

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| Supporting IM name |
| NTT |
| Samsung Electronics, CO., LTD |
|  |
| AT&T |
| LG Electronics Inc. |
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