**3GPP TSG-SA WG4 Meeting #127S4-240333**

**Sophia-Antipolis, France, 29 January - 2 February 2024**

**Source: NTT**

**Title: [FS\_eiRTCW] Pseudo-CR on Key Issue #9 and Solution #9 : Tethered cases**

**Spec: 3GPP TR 26.930**

**Agenda item: 10.9**

**Document for: Agreement**

**1. Introduction**

This pCR proposes to add the description of tethered cases into TR 26.930.

**2. Reason for Change**

Key issue 9 and solution #9 are expected to be included into TR 26.930 for completion of the TR.

**3. Proposal**

It is proposed to agree on the following changes to 3GPP TR 26.930.

The following modifications from PD are included.

- Added the solution evaluation for the solution #9 described in the eiRTCW PD.

- Editorial modifications.

\* \* \* First Change \* \* \* \*

## 10 Key Issue #9: Tethered cases

For a device with limited computing capability and communication capability due to the size and weight constraints such an AR glasses, it may be beneficial to tether to a nearby device that has stronger computing capability and communication capability such as a smart phone. The tethering case was studied in the SA4 SmarTAR study item and the outcome is documented in 3GPP TR 26.806 [xx].

The possible scenarios can be enumerated in several aspects:

- The type of tethered devices:
Among the types of AR glasses studied in 3GPP TR 28.806 [xx], two types are relevant to eiRTCW: the AR glasses only as a display of the tethered device, and the AR glasses as both a display and a host carrying out XR Runtime core functions. If the AR glasses serves only as a display, it may not have an IP address, in which case the content for display can be sent over the tethering link via L2 forwarding, and it may have an IP address, which, however, is invisible to the other WebRTC Endpoint.

- How many of the end devices are tethered:
Tethering may occur in only one of the end devices, or in both end devices. As an example, Figure 5.10-1 shows only one tethered device, which is the AR glasses.

- Tethering link is a 5G link or a non-3GPP link:
The tethering link could be a sidelink (defined by the PC5 interface), which is a 5G link. Alternatively, the tethering link can be a non-3GPP link such as a Wi-Fi link, as shown in Figure 5.6-1.

The combination of the aspects considered above results in many scenarios, and only one of them is shown in Figure 5.10-1.



**Figure 5.10-1: A tethering case with only one MNO involved.**

The key issue may be decomposed into several sub-issues:

* Key issue #9-1: Which scenarios are in the scope of tethered cases?
* Key issue #9-2: Should the WebRTC Endpoint be on the tethered device or on the tethering device?

To elaborate, in Figure 5.10-1, one of the WebRTC Endpoint is on the Application Server (e.g, serving as a cloud gaming server), but it is not clear where the other WebRTC Endpoint should be.

* Key issue #9-3: How to authenticate the tethered device?
* Key issue #9-4: Are there any difference between WebRTC endpoint on the tethered device and the WebRTC endpoint on a UE?
* Key issue #9-5: How to provide E2E QoS when there are non-3GPP networks also involved?

The support for multiple MNO’s on the E2E path is within the scope of this key issue.

## 6.10 Solution #9: Tethered cases

### 6.10.1 Solution description

This solution addresses Key Issue #9.

For sub key issue #9-2 (WebRTC Endpoint should be whether on the tethered device or on the tethering device), there are three design options:

- Solution #9-2-1:
The WebRTC Endpoint resides on the tethering device (e.g., on the phone). In this case, the tethered device (e.g., AR glasses) serves as a display (for video and audio).

- Solution #9-2-2:
The WebRTC Endpoint resides on the tethered device (e.g., on the AR glasses). In this case, the tethering device (e.g., the phone) serves as a relay.

- Solution #9-2-3:
The WebRTC Endpoint is split into two parts: one is the application (which is called WebRTC Endpoint App) residing on the tethered device, and the other one (which is called WebRTC Endpoint Support Function) is the signalling functions that communicate with the support functions in the eiRTCW architecture, residing on the tethering device.
The WebRTC Endpoint App maps to the Native WebRTC App or the Web App in the RTC general architecture, and WebRTC Endpoint Support Function maps to RTC endpoint in the general architecture shown in Figure 6.10.1-1.
A new interface Rt-u is created that allows the communication between the two parts. The Rt-u interface performs functions similar to those performed by the RTC-6, the RTC-7 and the WebRTC API interfaces in the iRTCW architecture. However, since the Rt-u interface is not within the same device (i.e., the UE), it involves the setup of a communication channel that may be defined by a protocol number and two port numbers.

Solution #9-2-3 is preferred because it allows the 5G system to have more control over the session (compared to Solution #9-2-2 while providing better QoS (compared to Solution #9-2-1).



Figure 6.10.1-1: Solution #9-2-1: WebRTC Endpoint resides on the tethering device



Figure 6.10.1-2: Solution #9-2-2: WebRTC Endpoint resides on the tethered device



Figure 6.10.1-3: Solution #9-2-3: WebRTC Endpoint is split, and the first part WebRTC Endpoint App resides on the tethered device and the second part WebRTC Endpoint Support Function resides on the tethering device.

NOTE 1: When the WebRTC Endpoint App corresponds to the Web App, the Rt-u interface maps to the WebRTC API interface in the general RTC architecture. When the WebRTC Endpoint App corresponds to the Native WebRTC App, the Rt-u interface maps to the RTC-6 and the RTC-7 interfaces in the general RTC architecture. Rs-u and Rm-u will go through the UE and Rt-u to the WebRTC Endpoint App for collaboration scenario 3 and collaboration scenario 4.

NOTE 2: The Rh-u, Rs-u and the Rm-u interfaces are the same as in the architecture described in clause 6.2 in this document

NOTE 3: How to introduce Rt-u on the RTC architecture is FFS.

### 6.10.2 Solution evaluation

This solution addresses sub Key Issue #9-2 and proposes possible tethered architecture for tethering/tethered devices. However, there are remaining sub Key Issues that could be further study.