**3GPP TSG-SA WG4 Meeting #127S4-240041**

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

**Source: NTT**

**Title: [FS\_eiRTCW] Pseudo-CR on Key Issue #7 and Solution #7: Interworking with IMS network**

**Spec: 3GPP TR 26.930**

**Agenda item: 10.9**

**Document for: Agreement**

**1. Introduction**

This pCR proposes to update the description of Key Issue #7 and Solution #7: Interworking with IMS Network.

**2. Reason for Change**

Key issue #7 and Solution #7 needs to be incorporated in TR 26.930 based on the agreement in FS\_eiRTCW PD.

**3. Proposal**

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

Following modification is introduced to incorporate the description of FS\_eiRTCW PD in TR 26.930.

- removal of following description from the since the description does not mention the technical aspects.

\* Total cost for realizing RTC service and basic & legacy audio call between RTC and IMS clients.

- editorial enhancements, deletion of unnecessary descriptions.

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

# 3 Definitions of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**Content Provider (CP)**: An RTC application provider who provide RTC services partially using operator's functionalities. CP connects to the operator network via UNI (RTC-4s/4m) as a WebRTC endpoint in order to use the operator's MF and WSF for the service specific content delivery.

**Originating RTC network**: A network which sends Media session set up request to another network (i.e., other operator network or SP network) over the NNI.

**Originating UE**: A RESPECT client on the UE which sends Media session set up request over the UNI.

**RESPECT client**: A RESPECT endpoint which acts as an WebSocket client.

**RESPECT endpoint**: A UE and RTC AS functionality supporting RESPECT protocol. RTC Aware Application on the UE or CP acting as UE, RTC AS for C-Plane signalling (i.e., WSF and IWF) that comply with RESPECT protocol are RESPECT endpoints. When distinction between UE/CP (acting as UE) and RTC AS is required, RESPECT endpoint (UE) or RESPECT endpoint (AS) is used respectively in this document.

**RESPECT server**: A RESPECT endpoint which acts as an WebSocket server.

**RTC network**: A DN dedicated to RTC. This network is compliant with the trusted DN of the RTC architecture defined 3GPP TS 26.506 [XX].

**RTC resource**: A media which a media session is connected to. Media service such as conference room, media content for distribution and RESPECT endpoint are example of RTC resource.

**RTC user**: An RTC service user who connects to the RTC service by using RESPECT endpoint.

**Service provider (SP)**: An RTC application provider who provides RTC services with its own network. SP owns resources and functionalities within its network, and SP's network is connected to operator network via NNI.

**Terminating RTC network**: A network which receives Media session set up request from another network (i.e., other operator network or SP network) over the NNI.

**Terminating UE**: A RESPECT client on the UE which receives Media session set up request over the UNI.

**User Equipment (UE)**: It indicates the user equipment and servers acting as user equipment such as a content server of a content provider. User equipment includes an RESPECT endpoint.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 29.165 [16] apply:

**Calling number verification using signature verification and attestation information**

For the purposes of the present document, the following terms and definitions given in IETF RFC 6455 [27] apply:

**WebSocket client**

**WebSocket server**

For the purposes of the present document, the following terms and definitions given in IETF RFC 8825 [44] apply:

**WebRTC Browser (also called a "WebRTC User Agent" or "WebRTC UA")**

**WebRTC Endpoint**

**WebRTC Non-Browser**

\* \* \* Next Change \* \* \* \*

## 5.8 Key Issue #7: Interworking with IMS network

This key issue addresses the functional requirement for interworking between RTC network and IMS network.

This key issue includes:

1) applicable interface between RTC network to IMS network,

2) supported interworking scenarios between RTC network and IMS network,

3) unctional requirements for RTC-IMS interworking and

4) RTC architecture enhancement for RTC-IMS interworking.

\* \* \* Next Change \* \* \* \*

## 6.8 Solution #7: Interworking with IMS Network

### 6.8.1 Solution description

This solution addresses Key Issue #7.

This solution identifies the followings to support interworking between RTC network and IMS network:

1) applicable interface between RTC network to IMS network,

2) supported interworking scenarios between RTC network and IMS network,

3) functional requirements for RTC-IMS interworking; and

4) RTC architecture enhancements for RTC-IMS interworking.

As a prerequisite, this solution is required to have no impact on existing IMS technical specifications and implementations.

### 6.8.2 Interface between RTC network and IMS network

#### 6.8.2.1 General

This clause identifies the applicable interface for interworking between RTC network and IMS network.

A solution for WebRTC-based service has been specified in Annex U of 3GPP TS 23.228 [xx], where the WebRTC endpoint can access to IMS network via user-network interface (UNI) by introducing eP-CSCF and eIMS-AGW as in Figure 6.8.2.1.



Figure 6.8.2.1: WebRTC IMS architecture and reference model in 3GPP TS 23.228

However, there is a possible demand that RTC network inter-connect to IMS network as another external IP multimedia network (so-called non-IMS).

Then, this solution considers RTC-IMS inter-connection using the network-to-network interface (NNI) between RTC network and IMS network.

Based on the prerequisite that this solution is required to have no impact on existing IMS technical specifications and implementations, this solution assumes the following conditions:

- RTC user (RTC endpoint) and IMS user (IMS UE) has its own MSISDN.

- In media session setup from RTC to IMS network, RTC endpoint (WebRTC endpoint) initiates media session by sending a media session setup request conforms to RTC signalling protocol (RESPECT) in this document, and both WSF and IWF forward the request towards IMS network based on the MSISDN of terminating IMS UE (tel URI) contained in the request.

- In media session setup from IMS to RTC network, IMS UE initiates media session by sending a media session setup request conforms to 3GPP TS 24.229 [xx], and IMS functional entities (e.g., S-CSCF) forward the request towards RTC network based on MSISDN of terminating RTC endpoint available in the request – this is an existing functionality of IMS network.

Table 6.8.2.1-1 shows the identifier of terminating endpoint for each scenario.

Table 6.8.2.1-1: Identifier of terminating endpoint for each scenario

|  |  |  |
| --- | --- | --- |
| Originating endpoint | Terminating endpoint | |
| RTC endpoint | IMS UE |
| RTC endpoint | RTC user identity | MSISDN |
| IMS UE | MSISDN | Public user identity |

NOTE: The usage of identifier other than MSISDN for RTC-IMS interworking scenario is FFS.

#### 6.8.2.2 Applicable interface between RTC network and IMS network

3GPP TS 29.162 [xx] already defines the interface between IMS network and external IP multimedia network as shown in Figure 6.8.2.2.1. This interface is appropriate for RTC-IMS interworking scenario, since RTC network is considered as an external IP multimedia network. Therefore, this solution applies this interface for interworking between RTC network and IMS network.



Figure 6.8.2.2-1: Interworking model between IMS network and external IP Multimedia Network

### 6.8.3 Interworking scenarios

#### 6.8.3.1 General

This clause identifies the supported interworking scenarios that consists of connection patterns and media session between RTC network and IMS network.

#### 6.8.3.2 Supported connection patterns

This clause identifies the supported connection patterns between RTC network and IMS network.

It is considered that there are following connection patterns.

1) Basic call between RTC endpoint and IMS UE

a) RTC endpoint initiates the media session setup to IMS UE

b) IMS UE initiates the media session setup to RTC endpoint

2) Conference call owned by media server

a) RTC endpoint connects to a conference room provided by IMS network

b) IMS UE connects to a conference room provided by RTC network

Since there is no different signalling requirement over the interface addressed in clause 6.8.2.2 between the connection pattern 1-a) and 2-a), this solution addresses 1-a), 1-b) and 2-b).

#### 6.8.3.3 Supported media session

This clause identifies the supported media session for interworking between RTC network and IMS network.

Media session provided by RTC network and/or IMS network could be categorized into the following two types:

- Basic & legacy audio call/conference

- Immersive media call/conference

As for basic audio call/conference, the interworking functionality needs to consider the several differences (e.g., signalling protocols, media capability, media transport protocols) between RTC media session and IMS media session.

As for immersive media call/conference, the interworking functionality does not need to consider the difference of media capability between RTC media session and IMS media session, compared to basic audio call/conference. This is because the two endpoints of the immersive media session are considered to have same media capabilities. That is, it is expected that immersive media call can be interconnected by using interworking specification for basic call.

Therefore, this solution focuses on the interworking of basic & legacy audio call/conference, which will cover the functional requirements for interworking of immersive media call/conference.

### 6.8.4 Functional requirements for RTC-IMS interworking

#### 6.8.4.1 General

This clause identifies the functional requirements for RTC-IMS interworking, based on the interface, interworking scenarios in clause 6.8.2 and 6.8.3. As described in clause 6.8.1, this solution is required to have no impact on existing IMS technical specifications and implementations as a basic requirement.

#### 6.8.4.2 Functional requirements for RTC network

This clause describes the functional requirements for RTC network.

1. RTC network is required to interwork the signalling message between RTC signalling protocol (RESPECT) in this document and SIP based IMS signalling protocol.

a) The RTC signalling protocol message initiated by RTC endpoint is required to be interworked to SIP based IMS signalling message and forwarded to IMS network at the boundary of RTC network.

b) The SIP based IMS signalling massage received from IMS network is required to be interworked to RTC signalling protocol message and forwarded to RTC endpoint at the boundary of the RTC network.

c) The difference between RTC signalling protocol and SIP based IMS signalling protocol is required to be terminated at the boundary of RTC network.

2. RTC network is required to interwork the media session between RTC and IMS networks.

a) Media transport protocol is required to be interworked between RTC media session and IMS media session at the boundary of RTC network. For example, DTLS/SRTP needs to be terminated and interworked to RTP, RTP and RTCP multiplexing needs to be terminated if not supported by connected IMS network.

b) When an SFU is applied for the media session on the RTC side, multiple media stream is required to be composed to a single media stream for IMS media session at the boundary of RTC network.

c) The differences of supported RTP header extension between RTC media session and IMS media session are required to be terminated at the boundary of RTC network.

3. RTC network is required to be possible to identify the call destined for IMS network or RTC endpoint by MSISDN available in signalling message and forward the call based on MSISDN.

#### 6.8.4.3 Functional requirements for IMS network

There are no functional requirements for IMS network.

### 6.8.5 RTC architecture enhancement for RTC-IMS interworking

This clause describes the enhancement on the RTC architecture, considering the functional requirements descried in clause 6.8.4 of this document.

As described in clause 4.2 of 3GPP TS 26.506 [XX], IWF (Interworking Function) and TGF (Transport Gateway Function) are defined as the functions supporting border control functionality to intwer-connect with different network.

The reference point between RTC network and IMS network is not defined in the current 3GPP TS 26.506 [XX]. Therefore, it is proposed that the interface defined in 3GPP TS 29.162 [x2] is applied for interworking between RTC network and IMS network.

Figure 6.8.5-1 shows the logical connection architecture for inter-connection between RTC network and IMS network.



Figure 6.8.5-1: Logical connection architecture for RTC-IMS inter-connection

### 6.8.6 Solution evaluation

This solution proposes the enhancement on existing RTC generic architecture to support RTC-IMS interwork. The proposed architcture fulfills the requriements described in clause 6.8.4 with no impact on IMS specifications and implementations. Therefore, it is proposed that the interface defined in 3GPP TS 29.162 [x2] is applied for interworking between RTC network and IMS network and reflected into stage2 specification of RTC (i.e., 3GPP TS 26.506 [xx]).

Protocol-level interworking between RTC network and IMS network based on the functional requirements and architecture enhancements proposed in this solution is addressed in Key Issue #8 and Solution #8.

\* \* \* End of Changes \* \* \* \*