**Agenda item:** 10.7

**Source:** InterDigital Communications, Samsung, Qualcomm

**Title: [GA4RTAR] Call Flows and Procedures for Collaboration Scenario (CS) 3**

**Document for:** Discussion andAgreement

# Introduction

In this contribution, we discuss the call flows and procedures for MNO facilitated 5G-RTC sessions (Collaboration Scenario 3).

# Proposal

|  |
| --- |
| 1st Change |

5.z Call flow for MNO-Facilitated RTC sessions (CS#3)

In collaboration scenario 3, MNO hosts the WebRTC sessions by providing a trusted WebRTC signalling server in the 5G-RTC AS. In addition, a trusted media server is also present in 5G-RTC AS to support SFU and MCU functionality. Note that, when the WebRTC application is a web-based application, the MSH function is not supported.

The call flows for this scenario when MSH is involved are as shown in Figure 1.



Figure 1. Call flows for MNO facilitated 5G-RTC sessions (collaboration scenario 3)

The 5G-RTC Application Provider may create a ***Provisioning Session*** with the 5G-RTC AF and starts provisioning the usage of the RTC Streaming session between two endpoints. During the establishment phase, the used features such as content consumption measurement, logging, collection and reporting; QoE metrics measurement, logging, collection and reporting; dynamic policy; network assistance; are negotiated and detailed configurations are exchanged.

The 5G-RTC Application Provider ***Provisioning*** ***Session*** phase is optionally performed prior to the establishment of any related WebRTC sessions by the 5G-RTC Application Provider. Detailed procedure is addressed in clause 5.2.

The ***ICE candidate discovery*** phase is performed with the following steps in an MNO-facilitated 5G-RTC system:

1. *Configuration information*: The 5G-RTC AF uses the RTC-5 interface to provide the MSH with a list of trusted STUN/TURN servers, trusted WebRTC signaling and data channel servers and their capabilities. The UE may use this configuration information for establishing RTC sessions.
2. *ICE Servers request*: The application queries the MSH for the list of trusted ICE servers.
3. *ICE candidate validation*: The UE discovers and tests the ICE candidates to validate that they are suitable for the connection.

The ***WebRTC session establishment*** phase is performed with the following steps in an MNO-facilitated 5G-RTC system:

1. *Query configuration information*: The WebRTC framework queries the MSH for the WebRTC signaling server information. In some cases where the signaling is not handled by WebRTC framework, the native WebRTC application queries the MSH for the WebRTC Signaling server information.
2. *Configuration information*: MSH sends the WebRTC signaling and data channel servers and their capabilities information to WebRTC framework or in some cases with native WebRTC application.

In ***SDP exchange*** phase, two or more WebRTC endpoints exchange signaling information related to the WebRTC session such as ICE candidates, SDP offer/answer using the trusted WebRTC signaling server.

NOTE: Figure xx illustrates that SDP offer is generated by the WebRTC Framework or native WebRTC Application. However, in SFU/MCU mode, SDP offer is generated by Media Function in 5G-RTC AS.

1. *SDP offer*: The WebRTC Framework or native WebRTC Application creates a request with SDP offer which includes the ICE candidates and sends it to the WebRTC signaling server.
2. *Determine UE2 location*: The WebRTC signalling server uses the registration information to locate the remote WebRTC endpoint referred as UE2
3. *SDP offer*: The WebRTC signaling server forwards the request to UE 2.
4. *SDP answer*: Upon accepting the offer, UE 2 responds to signalling server with SDP answer.
5. *SDP answer*: WebRTC signalling server sends the SDP answer to the UE1.

With this, a WebRTC session is established between WebRTC endpoints using the most suitable ICE candidate and the WebRTC signaling server.

The ***Dynamic policy*** phase is then performed to allocate QoS for the media streams of the RTC session with the following steps:

1. *QoS request*: The WebRTC signaling server sends a request to 5G-RTC AF for the allocation of QoS for the session. The 5G-RTC AF sends a request to the PCF to allocate QoS for the media streams of the RTC session
2. *Confirmation*: PCF or SMF confirms the successful allocation of network support or QoS allocation.

If the Network support function feature is supported in the 5G-RTC AF, then the Network Support Function AF (NS-AF) offers the bitrate recommendation request API based on existing policy templates, through the usage of either the Npcf\_PolicyAuthorization API over N5 interface, or the Nnef\_AFSessionWithQoS over N33 interface to the PCF. If no corresponding AF application session context already exists, the NS-AF uses the Npcf\_PolicyAuthorization\_Create method over N5 interface with the appropriate service information to create and provision an application session context. The ***Network assistance*** phase is performed with the following steps in an MNO-facilitated 5G-RTC system.

1. *Subscribe to QoS events*: The NS-AF also subscribes to events related to the QoS flows of the WebRTC session with the PCF and SMF.
2. *QoS events*: The NS-AF receives notifications about any changes to the QoS flows of the WebRTC session from the PCF or the SMF.
3. *QoS notifications/ Bitrate recommendations*: The NS-AF may send notifications to the MSH about the changes in QoS flow. When the allocated session is active, the MSH forwards the bitrate recommendation to the application.
4. *Adjust media bitrate*: The WebRTC application may act on adjusting the bitrate recommendation, e.g., by reducing the uplink media bitrate.

After successful creation of a WebRTC session and the bitrate negotiations, the actual ***WebRTC session*** over 5G may start:

1. *Media transfer*:
   1. The WebRTC Application may connect to the selected TURN server and/or Media Function in the “5G-RTC AS” through the RTC-4m interface and real-time communication starts, and the media is delivered to the remote endpoint.
   2. In some cases, a peer-to-peer connection is also possible and the media is delivered directly to the remote endpoint.
2. *Method calls and notifications*: Supporting information about the WebRTC session is passed from the WebRTC framework to the Media Session Handler.
3. *Reporting, network assistance, and dynamic policy*: The Media Session Handler exchanges supporting information about the WebRTC session with the 5G-RTC AF.
4. *End session*: The WebRTC Application informs the WebRTC framework that the RTC session has ended. It is also sent to the WebRTC Signalling Function to terminate the session.
5. *Session ending event*: The WebRTC framework informs the Media Session Handler about the end of the RTC session.
6. *Final reporting*: The Media Session Handler performs any final reporting to the 5G-RTC AF.