**3GPP TSG-WG SA4 Meeting #124**

**Berlin, DE, 22nd – 26th May 2023 (*update to S4-230802)***

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| *CR-Form-v12.2* |
| **PSEUDO CHANGE REQUEST** |
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|  | **26.113** | **CR** |  | **rev** |  | **Current version:** | **0.5.5** |  |
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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:***  | Updates to the SWAP protocol |
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| ***Source to WG:*** | Qualcomm Inc. |
| ***Source to TSG:*** | S4 |
|  |  |
| ***Work item code:*** | iRTCW |  | ***Date:*** | 16th May 2023 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-18 |
|  | *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-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | This pCR fixes a few mistakes and describes the operation of the SWAP protocl. |
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| ***Summary of change:*** |  |
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| ***Consequences if not approved:*** |  |
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| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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| **First Change** |

##### 6.2.4.4.1 Common message fields

###### 6.2.4.4.1.1 Source (source)

Each message shall carry a unique source identifier that identifies the message source. The source identifier shall be a randomly generated string. The source identifier shall not be changed during the lifetime of a session.

A SWAP server that detects a change in the source identifier from an endpoint over the same WebSocket connection shall ignore the corresponding message. The source identifier shall at least have 10 UTF-8 characters.

###### 6.2.4.4.1.2 Message Identifier (message\_id)

The message identifier shall be a sequence number for the message. The message identifier is scoped by the source identifier, i.e., it shall be uniquely assigned by the source of the message.

The message identifier shall be a positive monotonically increasing number.

###### 6.2.4.4.1.3 Message Type (message\_type)

The message type identifies the type of the SWAP message. The supported message types in version 1 of the specification are:

* Register
* Response
* Connect
* Accept
* Reject
* Update
* Close
* Application.

The message type shall be considered as a case-insensitive string.

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| **Second Change** |

###### 6.2.4.4.3.2 Parameters

type: the type parameter may either be “ack” or “error”

target: the identifier of the target of this message, which originated the request message corresponding to this response.

request: the message identifier of the request message that corresponds to this response.

description: in case of an error response, this field provides a description of the error message. In case of an acknowledgement, this description field is optional.

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| **Third Change** |

###### 6.2.4.4.4.2 Parameters

offer: a string that includes the SDP description for the offer.

matching\_criteria: an array that contains the matching criteria for the target endpoint. Each object shall comply with the definition of a matching criteria as described in clause 6.2.4.4.2.

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| **Fourth Change** |

##### 6.2.4.4.5 Accept message

###### 6.2.4.4.5.1 Description

If the connection request is accepted by the remote endpoint, it shall reply with an accept message. The accept message shall contain the answer SDP.

###### 6.2.4.4.5.2 Parameters

target: this parameter indicates the id of the target endpoint.

answer: This parameter shall contain the answer SDP.

##### 6.2.4.4.6 Update message

###### 6.2.4.4.6.1 Description

The update message may be sent by any of the endpoints of a WebRTC session. It contains the updated SDP, which may add, update, or remove one or more local media streams. If accepted, the remote endpoint shall reply with an accept message.

###### 6.2.4.4.6.2 Parameters

target: this parameter indicates the id of the target endpoint.

sdp: The updated local SDP that is transmitted to the remote endpoint.

##### 6.2.4.4.7 Reject message

###### 6.2.4.4.7.1 Description

In case the remote endpoint does not accept the offer or update message, it shall respond with the reject message. The message shall contain a reference to the corresponding offer or update message as well as a description of the reason why the message was rejected.

###### 6.2.4.4.7.2 Parameters

target: this parameter indicates the id of the target endpoint.

request: the message identifier of the request

error\_id: an identifier of the error message

description: a description of the error message.

##### 6.2.4.4.8 Close message

###### 6.2.4.4.8.1 Description

The close message may be triggered by any of the two endpoints of a WebRTC session. Upon reception, the endpoint shall respond with an accept message, after which the WebRTC session is torn down and the resources associated with the WebRTC session are released.

###### 6.2.4.4.8.2 Parameters

target: this parameter indicates the id of the target endpoint.

###### 6.2.4.4.9 Application message

###### 6.2.4.4.9.1 Description

Application-specific message may be defined by the application and exchanged between the endpoints of a WebRTC session. The message shall contain a type that uniquely identifies the type of the application message. If an application message type is not supported, it shall be rejected by the remote endpoint.

###### 6.2.4.4.9.2 Parameters

###### 6.2.4.4.6.2 Parameters

target: this parameter indicates the id of the target endpoint.

type: the type of the application message shall be a URN that uniquely identifies the application message type.

value: an object that contains the application message content.

#### 6.2.4.7 Protocol Operation

SWAP is an acknowledged signaling protocol for WebRTC. Each message that the WebRTC signaling server receives shall be acknowledged after proper processing. This is valid for the case where one of the endpoints acts as the signaling server. The Response message may also indicate an error, in case the received message can not be processed and forwarded properly.

The error messages shall be formatted according to the Problem Details specification in RFC7807. The following error message types are defined in this specification:

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| **Error message type** | **Error message title** |
| http://forge.3gpp.org/sa4/swap/message\_unknown.html | Message type unknown |
| http://forge.3gpp.org/sa4/swap/message\_malformatted.html | Message malformatted |
| http://forge.3gpp.org/sa4/swap/target\_unknown.html | Target cannot be located |
| http://forge.3gpp.org/sa4/swap/unauthorized.html | Unauthorized |

The WebRTC Signaling Function uses the (source, target) identifier pairs of the communicating endpoints to identify the session and properly route the messages. Note that in the first connect message, the target identifier might not be known; in which case, the routing is done based on the matching criteria.

The source identifier shall be a string that uniquely identifies the source. An example of such identifier may be a randomly generated UUID.

Every message shall contain the common message fields: source, message\_id, and message\_type. The source field shall always indicate the originator of the current message. A WebRTC signaling server shall also generate and use a unique identifier.