**3GPP TSG SA WG2 Meeting #160 *S2-2313476***

**November 13 - 17, 2023, Chicago, USA revision of S2-2313043**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** | **1374** | **rev** |  | **Current version:** |  |  |
|  |
| *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 | **X** |

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|  |
| ***Title:***  | Update of P2A and P2A2P procedures |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 14 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** |  |
|  | *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)* |
|  |  |
| ***Reason for change:*** | It is not clear when and how MF/MRF media resources are updated in case of P2A and P2A2P procedures. |
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| ***Summary of change:*** | Modify P2A and P2A2P procedures to clarify update of media resources at MF/MRF. |
|  |  |
| ***Consequences if not approved:*** | Incomplete specification |
|  |  |
| ***Clauses affected:*** | AC.6, AC.7.2.2, AC.7.2.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* First change \* \* \* \*

# AC.6 Data Channel Media Setup

MF and the MRF provides media anchoring when needed for the IMS Bootstrap Data Channel, and the IMS Application Data Channel. To that effect, they support the following capabilities:

- HTTP Proxy: In this configuration, MF/MRF supports terminating DTLS with HTTP traffic being transparent to MF/MRF. When acting as HTTP Proxy, MF/MRF reserves media resources for both the originating side and the DC Application Server allowing to send HTTP traffic to the DC Application Server. This mode is deployed both for Bootstrap Data Channel, and HTTP Application Data Channels. Figure AC.6-1 illustrates the protocol stack for the HTTP proxy configuration mode for the Bootstrap Data Channel case.

 When used with HTTP Application Data Channel, the downloaded Data Channel application will in this case communicate with the DC Application Server, using basic HTTP, within the same bootstrap SCTP association as in which this application was downloaded. UDP, TCP and SCTP should be supported as the transport layer protocols for MDC2.



Figure AC.6-1: MF/MRF "HTTP Proxy" Media Configurations

- UDP Proxy: In this configuration, MF/MRF transparently proxies HTTP traffic to its target. When acting as UDP Proxy, the media resources reserved by MF/MRF contain MF/MRF connection information (e.g., IP address and port number). This mode is deployed only for Application Data Channels. Figure AC.6-2 illustrates the protocol stack for the UDP proxy configuration mode for the Application Data Channel case, providing a Person2Application/Application2Person/Person2Person Data Channel Application.



Figure AC.6-2: MF/MRF "UDP Proxy" Media Configurations

\* \* \* \* Next change \* \* \* \*

### AC.7.2.2 Person-to-Application (P2A) Application Data Channel Setup

Figure AC.7.2.2-1 depicts a signalling flow diagram for establishing an Application Data Channel in a person to application use case.



Figure AC.7.2.2-1: Person-to-Application (P2A) Application Data Channel set up Signalling Procedure

The steps in the call flow are as follows:

0-3. Steps 0-3 of clause AC.7.2.1 applies.

4. After receiving the session event notification, the DCSF determines the policy about how to process the application data channel establishment request based on the related parameters (i.e. associated DC application binding information) in the notification and/or DCSF service specific policy.

5. The DCSF determines that the added Application Data Channel media of the offer takes DC Application Server as target endpoint and requires to anchor in the MF or MRF.

6. The DCSF invokes Nimsas\_MediaControl service operation to instruct IMS AS to terminate the media flow of the originating UE to MF. The instruction also includes information to be consumed by the MF that the data channel media shall be relayed via the MDC2 interface.

7. The IMS AS invokes Nmf\_MRM\_Create(List of Media Termination Descriptors) service operation to instruct MF on application data channel establishment and data channel media resource reservation based on the DC media information received from DCSF. If MRF is used, IMS AS uses Mr'/Cr to MRF to reserve data channel media resources.

8. The IMS AS notifies the MediaControl instruction control response to DCSF.

9. The DCSF stores the media resource information and sends a P2A application data channel establishment request (including the MDC2 media resource received from MF/MRF) to the DC Application Server via DC3/DC4.

10. DC Application Server accepts the P2A application data channel establishment request, returning an MDC2 reserved media resource as answer and is prepared for UE#1 traffic through MDC2.

NOTE: Details on how DCSF communicates with the DC Application Server is out of scope of this Release.

11. DCSF requests IMS AS to update the MF/MRF resource with MDC2 media endpoint information of DC Application Server.

12. IMS AS updates the MF/MRF resource.

13. IMS AS notifies the MediaControl instruction control response to DCSF.

14. DCSF replies to the notification received in step 13.

15-16. IMS AS sends the re-INVITE to remote network side and UE#2, via the originating S-CSCF, which does not include application data channel request in the SDP for the application data channel.

17-19: UE#2 and terminating network returns a 200 OK response with SDP answer for audio/video.

20. IMS AS notifies the DCSF about the successful result of the MediaChangeRequest event.

21. DCSF replies to the notification.

22-23. The IMS AS includes SDP answer for application data channels to UE#1 in 200 OK response and sends 200 OK response to S-CSCF and P-CSCF.

24. The originating network P-CSCF executes QoS procedure for application data channel media based on the SDP answer information from the 200 OK response.

25. CSCF returns the 200 OK response to UE#1.

26. UE#1 send ACK to the terminating network.

27. The application data channel between UE#1 and DC Application Server is established via MF or MRF. MF or MRF forwards data channel traffic between UE#1 and DC Application Server based on MDC2 media point information received in step 9 and 12.

\* \* \* \* Third change \* \* \* \*

### AC.7.2.3 Person-to-Application and Application-to-Person (P2A2P) Procedure

This procedure enables originating and terminating UE to establish application data channels for the same application to communicate with the same Data Channel Application Server.

The P2A2P procedure requires the establishment of application data channels from UE#1 to MF and from UE#2 to MF. The two application data channels are associated with the same application. This enables UE#1 and UE#2 to interact with the same DC Application Server simultaneously and the DC Application Server to correlate the data exchanged with both UEs. The P2A procedures as described in clause AC.7.2 are used to establish one application data channel between UE#1 and MF and, for A2P scenario, one application data channel between UE#2 and MF. In case of two involved UEs, this enables independent communication between UE#1 and UE#2 with the DC Application Server.



Figure AC.7.2.3-1: Symmetric Application Data Channel Establishment

0. IMS session and bootstrap data channels are established. Selected data channel applications are downloaded to UE#1 and possibly UE#2.

1. UE#1 sends SIP re-INVITE request with an updated SDP to IMS AS. The updated SDP contains the bootstrap data channel, the application data channel information and associated DC application binding information.

2. IMS AS validates the data channel media description information and/or user subscription data to determine whether the DCSF needs to be notified.

3. IMS AS selects and notifies the DCSF about the call event and data channel establishment request.

4. The DCSF determines how to process the application data channel establishment request based on the parameters (i.e. associated DC application binding information) in the notification from IMS AS and/or DCSF service specific policy.

5. DCSF determines that the added application data channel media in the SDP offer requires the DC Application Server is the endpoint for both originating and terminating UE and that the application DC must be anchored at the MF or MRF. DCSF communicates with the DC Application Server for DC resource control. Once the application data channel is established, the DC Application Server will send/receive traffic to/from UE#1 through the MDC2 interface.

NOTE 1: Details on how the DCSF communicates with the DC Application Server are out of scope of this release.

6. DCSF invokes Nimsas\_MediaControl service to send data channel control request to IMS AS, including information how to relay data channel media via the MDC2 interface.

7. IMS AS reserves data channel media resources at the MF via DC2 or at the MRF via Mr'/Cr based on the DC media information received from DCSF.

8. IMS AS notifies the DCSF about MediaControl instruction control response.

9. DCSF communicates with the DC Application Server for DC resource control and provides information on data channel media resources reserved at the MF.

10. The DCSF stores the media resource information and replies to the Nimsas notification request.

11-12. IMS AS sends re-INVITE which include the SDP offer from MF or MRF for the application data channel to the originating S-CSCF and then to the remote network and UE#2.

13-16. UE#2 and terminating network return 200 OK with SDP answer for audio/video and for the application data channel. The terminating network P-CSCF executes QoS procedure for application data channel media based on the SDP in the 200 OK. Based on the received DC Application binding information in the re-INVITE, UE#2 may need to download the corresponding DC Application signalled in the SDP offer, if not done already and associate it with the requested application DC.

NOTE 2: The UE at the terminating side is capable to determine if to use the DC application based on the received DC application binding information.

17. IMS AS notifies the DCSF about the successful result of the MediaChangeRequest event.

18. DCSF replies to the notification received in step 17.

19. IMS AS requests MF or MRF to update the media resources.

20-21. The IMS AS includes SDP answer for application data channel to UE#1 in 200 OK and sends 200 OK to S-CSCF and P-CSCF.

22. The originating network P-CSCF executes QoS procedure for application data channel media based on the SDP in the 200 OK.

23. P-CSCF returns the 200 OK to UE#1.

24. UE#1 sends ACK to the terminating network.

25. The application data channel between UE#1 and DC Application Server is established via MF or MRF. MF or MRF forwards data channel traffic between UE#1 and DC Application Server via MDC2.

26. The application data channel between UE#2 and DC Application Server is established via MF or MRF. MF or MRF forwards data channel traffic between UE#2 and DC Application Server via MDC2.

\* \* \* \* End of changes \* \* \* \*