**TSG SA Meeting #SP-100 SP-230xxx**

**12 - 16 June 2023, Taipei (Revision of S2-2307528)**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **23.228** | **CR** | **1295** | **rev** | **5** | **Current version:** | **18.1.0** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:***  | Update on the usage of DC App-ID, and P2A2P procedures |
|  |  |
| ***Source to WG:*** | Qualcomm Incorporated, vivo, Nokia, Nokia Shanghai Bell, ZTE |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | NG\_RTC |  | ***Date:*** | 2023-05-30 |
|  |  |  |  |  |
| ***Category:*** | **C** |  | ***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-12 (Release 12)Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | Both S2-2307508 (Nokia, ZTE) and S2-2307528 (QC, vivo) were agreed at S2#157. A clash is detected with these two CRs. S2-2307508 updates the P2A2P call flow in clause AC.7.3 while S2-2307528 moves the same clause under AC.7.2.x, making AC.7.3 void and doing on top changes to the call flow. The best way is to bring a CR to the plenary merging with all changes into one tdoc and disapprove 7508 and 7528. |
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| ***Summary of change:*** | Merge all the changes of S2-2307508 and S2-2307528 into one CR to resolve the potential clash. |
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| ***Consequences if not approved:*** | The two separate CRs are not able to be implemented in TS 23.228. |
|  |  |
| ***Clauses affected:*** | Annex AC.5; AC.7.2.1; AC.7.2.2; AC.7.3, AC.7.2.x |
|  |  |
|  | **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:*** |  |

>>>>BEGINNING OF CHANGES<<<<

# AC.5 Binding of DC Application with the related DC

Information for the binding of DC Application with the related DC is required to support multiple, simultaneous DC applications in a UE.

The binding information is maintained by the HPLMN or retrieved from DC application provider when a DC Application is uploaded to DCSF. DCSF may be configured with a DC application profile associated with the binding information, which indicates the DC control policy (e.g. whether the Application DC establishment follows the P2P ,P2A/A2P or P2A2P procedure). The UE receives the binding information of a DC application via the Bootstrap DC, e.g. when the DC application is downloaded to the UE.

When the UE is establishing an IMS Application DC as defined in clause AC.7.2, the binding information is provided by the UE in the SDP offer as described in TS 26.114 [76]. The IMS AS provides the binding information to the DCSF. The DCSF may use the binding information for controlling the Application DC setup .

>>>>NEXT CHANGE<<<<

### AC.7.2.1 Person to Person (P2P) Application Data Channel Setup

Figure AC.7.2.1-1 depicts a signalling flow diagram for establishing an Application Data Chanel in a person-to-person use case. The DCMF is not used to anchor the Application data channel.

In the call flow the UEs have already established an IMS audio session, and the originating UE is updating the IMS audio/video session to an IMS Data Channel session.



Figure AC.7.2.1-1: Person-to-Person Application Data Channel set up Signalling Procedure

The steps in the call flow are as follows:

- Step 0: IMS session and bootstrap data channel have been established. Selected data channel application(s) have been downloaded to UE#1 and possibly UE#2.

- Step 1: UE#1 sends the SIP reINVITE request with an updated SDP to IMS AS, through originating network P-CSCF and S-CSCF. The updated SDP contains the Bootstrap data channel information, as well as the requested Application Data Channel and the associated DC application binding information per TS 26.114 [76].

- Step 2: IMS AS validates user subscription data to determine whether the media change request should be triggered to DCSF.

- Step 3: IMS AS notifies the DCSF, via Nimsas\_SessionEventControl\_Notify (MediaChangeRequest Event, SessionID, EventDirection, MediaInfoList) of the media update request event.

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

- Step 5: DCSF determines that the added Application Data Channel media descriptor of the SDP offer takes UE#2 as target endpoint and does not requiring anchoring in the local DCMF or MRF. If DCMF or MRF needs to anchor application data channel, DCSF would have used the Nimsas\_MediaControl service to instruct IMS AS to allocate data channel media resources of the DCMF or MRF.

- Step 6: DCSF responds to the notification received in step 3.

- Steps 7-8: IMS AS sends the re-INVITE to the originating S-CSCF and then to the terminating network side and UE#2.

- Steps 9-11: UE#2 and terminating network returns a 200 OK response with SDP answer for application DC to originating network. Based on the received DC application binding information in the SDP offer of 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: The UE at the terminating side is capable to determine if to use the DC application based on the received DC application binding information.

- Step 12: IMS AS notifies the DCSF of the successful data channel modification.

- Step 13: DCSF responds to the notification.

- Steps 14-15: The IMS AS sends 200 OK response to the originating S-CSCF and P-CSCF.

- Step 16: The originating network P-CSCF executes QoS procedure for application data channel media based on the SDP answer information from the 200 OK response.

- Step 17: P-CSCF returns the 200 OK response to UE#1.

- Step 18: UE#1 sends ACK to the terminating network.

- Step 19: The application data channel between UE#1 and UE#2 is established. In this example, it is not anchored in DCMF/ MRF.

>>>>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 Chanel 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:

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

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

- Step 5: 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 DCMF or MRF.

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

- Step 7: IMS AS invokes DCMF service to instruct DCMF on application data channel establishment and data channel media resource reservation based on the DC media information received from DCSF. For IMS AS to stand alone DCMF, DC2 is used to reserve data channel media resources. If MRF is used, IMS AS uses Mr'/Cr to enhance MRF to reserve data channel media resources.

- Step 8: IMS AS notifies the MediaControl instruction control response to DCSF.

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

- Step 10: DC Application Server accepts the P2A application data channel establishment request, returning an MDC2 SDP 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.

- Step 11: DCSF requests IMS AS to update the DCMF resource with MDC2 media endpoint information of DC Application Server.

- Step 12: IMS AS updates the DCMF resource.

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

- Step 14: DCSF replies to the Nimsas notification request.

- Steps15-16: 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.

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

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

- Step 21: DCSF replies to the notification.

- Steps 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.

- Step 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.

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

- Step 26: UE#1 send ACK to the terminating network.

- Step 27: The application data channel between UE#1 and DC Application Server is established via DCMF or MRF. DCMF 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.

>>>>NEXT CHANGE <<<<

(original content moved from AC.7.3)

### AC.7.2.x 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 DCMF and from UE#2 to DCMF. 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 DCMF and, for A2P scenario, one application data channel between UE#2 and DCMF. 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.x-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 DCSF and/or operator policies.

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 DCMF 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: 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 DCMF 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 DCMF.

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 DCMF 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: 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 IMS AS.

19-20. 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.

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

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

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

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

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

>>>>NEXT CHANGE<<<<

## AC.7.3 Void

>>>>END OF CHANGES<<<<