**3GPP TSG- Meeting #**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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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:***  |  |
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| ***Source to WG:*** | , , Samsung Electronics Co., Ltd. |
| ***Source to TSG:*** |  |
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| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***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)* |
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| ***Reason for change:*** | How data channels are bound to applications retrieved by UEs in a DCMTSI call is under-specified in TS 26.114. The UEs need the ability to identify the applications that are requesting which data channels are to be established. The inclusion of an application identification in the SDP offer and answer would resolve ambiguities and address other requirements discussed in S4-221243/S2-2209617. As next step to the discussion in S4-221556, this CR captures the changes to TS 26.114 to provide the application identification information via the SDP. |
|  |  |
| ***Summary of change:*** | Defines an attribute to the SDP offer/answer exchanges to enable UEs to identify applications and bind them to the data channels established for the respective applications. |
|  |  |
| ***Consequences if not approved:*** | Binding offer and aswers to applications on the two UEs on a call that includes IMS data channels will remain under-specified. |
|  |  |
| ***Clauses affected:*** | 6.2.10.1, 6.2.10.2, A.17, adds 6.2.12 and M12 |
|  |  |
|  | **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:*** | Revision 4 of S4-221349 |

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| **1st Change** |

### 6.2.10 Data channel

#### 6.2.10.1 General

Support of data channel media is optional for an MTSI client and an MTSI client in terminal. For brevity, an MTSI client supporting data channel is henceforth denoted as a DCMTSI client or DCMTSI client in terminal, respectively.

To indicate support for the procedures in this clause, a DCMTSI client shall when including media feature tags as specified in TS 24.229 [7] include a +sip.app-subtype media feature tag, as specified by RFC 5688 [177], with a value of "webrtc-datachannel" (the application media format used by [172]), regardless of data channel media being part of the SDP or not.

One or more data channel SDP media descriptions formatted according to [172] may be added to the SDP, alongside other SDP media descriptions such as e.g. speech, video, and text. A data channel SDP media description must not be placed before the first SDP speech media description. SDP examples are provided in Annex A.17.

If data channels are used in a session, the session setup shall determine the applicable bandwidth limit(s) as defined in clause 6.2.5.

Multiple data channels may be mapped to a single data channel SDP media description, each with a corresponding "a=dcmap" SDP attribute and stream IDs that are unique within that media description. There is no limit to the number of data channels in an SDP media description, but the aggregate of all defined data channels must keep within the set bandwidth limit and care should be taken to avoid excessive SDP size. If the session is re-negotiated to include a changed number of data channels in an SDP media description, the bandwith limit may either be kept constant, changing the share of bandwidth available to each individual data channel, or the bandwidth limit may be changed to accommodate the changed number of data channels, keeping individual data channel bandwidth shares. Regardless of what approach is used when changing number of used data channels in a media description, the aggregate of all defined data channels must keep within the re-negotiated bandwidth limit.

If there is a need to use data channels with either different transport IP addresses, different UDP ports, or different SCTP ports, separate data channel SDP media descriptions must be used, as IP address, UDP port and SCTP port are all constant per SDP media description. Multiple SCTP associations for a single channel, commonly denoted as "multi-homing", defined in IETF RFC 4960 [173] for reasons of redundancy and basically using one destination transport address at a time, is not described for use with WebRTC data channel and must therefore not be used in this specification.

NOTE 1: The main reasons to not specify multi-homing are because it cannot use the needed separation of signalling paths for redundancy purposes in the applicable usage scenarios, and it is also not considered feasible when using SCTP on top of DTLS.

To ease data channel media implementation and ease interworking with WebRTC data channels, DCMTSI clients must support ICE Lite and may support full ICE [184], for data channel media. DCMTSI clients supporting full ICE must only use host candidate addresses. SDP "a=candidate" line host address information must match corresponding SDP "c=" and "m=" line information.

NOTE 2: In typical IMS deployments, it is expected that DCMTSI clients have no need to use STUN or TURN servers with ICE. This is in line with what constitutes an ICE Lite agent.

Data channel stream IDs below 1000 must be reserved for using the HTTP [73] protocol, henceforth denoted as "bootstrap data channels", to retrieve an HTML web page including JavaScript(s), and optionally image(s) and style sheet(s), henceforth denoted as a "data channel application". The data channel application accessible at the HTTP root ("/") URL through a bootstrap data channel describes the graphical user interface and the logic needed to handle any further data channel usage beyond the bootstrap data channel itself. The meaning of the "authority" (host) part of the URL and consequently the "Host" HTTP header are not defined, shall be ignored on reception, and shall be set to the empty value by a DCMTSI client in terminal.

The data channel application is created prior to the DCMTSI call where it is intended to be used, by means left out of scope for this specification. The data channel application workflow is depicted by Figure 6.2.10.1-1 below.



Figure 6.2.10.1-1: Data Channel Workflow

The data channel application is, referring to the numbered arrows in Figure 6.2.10.1-1:

1. Uploaded to the network, by the UE user or some other authorized party.

2. Stored in a data channel application repository in the network.

3. During the DCMTSI call where it should be used, retrieved from the repository.

4. Sent through a bootstrap data channel to the local UE A.

5. Sent through a bootstrap data channel to the remote UE B. This may happen in parallel with and rather independent of step 4.

6. Any additional data channels created and used by the data channel application itself are established (logically) between UE A and UE B. Data transmission on data channels shall not start until there is confirmation that both peers have instantiated the data channel, using the same procedures as described for WebRTC in section 6.5 of [172]. The traffic may effectively go through the Data Channel Server, e.g., when the bootstrap and end-to-end data channels have the same anchoring point. This traffic may pass across an inter-operator border if UE A and UE B belong to different operators’ networks.

The bootstrap data channel is not intended for use directly between DCMTSI clients in terminal. DCMTSI clients in terminal that receive HTTP requests on a bootstrap data channel shall ignore such request and shall update the session by removing the SDP "a=dcmap" line with the stream ID where such HTTP request was received, and closing that stream ID.

The data channel application sent in a bootstrap data channel may be updated at any time, automatically or interactively, using normal HTTP procedures.

A bootstrap data channel must be configured as ordered, reliable, with normal SCTP multiplexing priority. The bootstrap data channel shall use a well-defined sub-protocol. The sub-protocol should be HTTP (not encapsulating HTTP in TCP), represented by the following, example SDP "a=dcmap" line, which therefore must be present in each data channel media description in an SDP offer from a DCMTSI client in terminal:

 a=dcmap:0 subprotocol="http"

When the HTTP subprotocol is used, any other data channels used by the data channel application JavaScript(s) sent in the bootstrap data channel must be represented in an updated SDP as additional "a=dcmap" lines with stream ID values starting from 1000, using stream ID numbers from the JavaScript(s).

There are multiple, possible providers of data channel applications. In Figure 6.2.10.1-1, assume that UE A is local to the operator hosting the data channel server. Further assume that UE B belongs to a different operator (remote). The user of UE A can create and use data channel applications (steps 1-4), which can also be sent to UE B (step 5). Similarly, some other authorized part associated with UE A’s operator can create data channel applications for use by UE A (steps 1-4), which can also be sent to UE B (step 5). For simplicity, there’s no data channel server and data channel application repository depicted for UE B in Figure 6.2.10.1-1, but those could be present in a more general case. Seen from the perspective of a single UE, there are then at least four possible data channel application providers:

1. The local UE user.

2. Other authorized parties associated with the local network (e.g. the local operator).

3. The remote UE user.

4. Other authorized parties associated with the remote network (e.g. the remote operator).

The HTML web content making up a data channel application in each bootstrap data channel represents a different context of user interaction and should open in a separate tab, or some corresponding user interface construct, but the details are out of scope for this specification and left open for individual implementations. It must be possible to use and navigate between different data channel applications from different bootstrap data channels with different stream IDs that are open simultaneously.

Table 6.2.10.1-2 describes a mandatory mapping between stream ID and bootstrap channel data channel application content sources, as seen from a single (local) DCMTSI client in terminal, each of which shall be listed as separate "a=dcmap" lines with "http" subprotocol in SDP when the DCMTSI client in terminal supports receiving data channel application content from that source.

Table 6.2.10.1-2: Bootstrap Data Channel Content Sources

|  |  |
| --- | --- |
| **Stream ID** | **Content Source** |
| 0 | Local network provider |
| 10 | Local user |
| 100 | Remote network provider |
| 110 | Remote user |

NOTE 3: When the local user has defined and stored multiple, different data channel applications in the local data channel application repository, the local network provider may provide functionality in the stream ID 0 data channel application that enables a dynamic choice of which user-defined data channel application to use with stream ID 10 in the DCMTSI call.

Figure 6.2.10.1-3, referring to Figure 6.2.10.1-1 and Table 6.2.10.1-2, is depicting the stream IDs used for distribution of a data channel application owned by UE A from its local data channel repository to both UE A (stream ID 10) and its remote UE B (stream ID 110).



Figure 6.2.10.1-3: Distribution of local data channel application to both UE

When the user in UE A in a call with UE B selects application(s) for retrieval and use, and after the new application(s) are launched, the application(s) may make use of additional data channel(s) (see step 6 of 6.2.10.1-1). In this case, UE A initiates a call upgrade to add new data channel(s) to the call for the new application(s). The SDP offer the UE A generates shall include a "a=3gpp-req-app" line with "req-app-id" parameter to identify the requesting application as part of the media description creating data channels for that application. The application should be configured with that identification and the network deployment should ensure that identification to be sufficiently unique to avoid ambiguity. The "a=3gpp-req-app" attribute may also include an "endpoint" parameter to allow the application to identify a different end point when creating multiple application data channels used for communication to a network server or to the remote UE. The combination of 'req-app-id' parameter and "endpoint" parameter allows the communicating UEs to bind the SDP offers and answers for each data channel being negotiated to the respective applications using these data channels. When the value of "req-app-id" parameter indicates the URL for the retrieval of the data channel application requesting data channel(s), the "a=3gpp-req-app" attribute shall include "req-app-id-format" paramter set to URL.

For deployments when applications are retrieved on the remote UE as part of a call upgrade (re-INVITE), the "a=3gpp-req-app" attribute may also include a "bootstrap" parameter which identifies the bootstrap stream ID from where the remote UE receiving an SDP offer in a re-INVITE would retrieve the corresponding application.

#### 6.2.10.2 Generating SDP offer

A DCMTSI client in terminal may include a data channel media description for the bootstrap data channels in the initial SDP offer, as described above and according to [172] [184]. A DCMTSI client in terminal may add or disable (by setting port 0, as for RTP media) additional data channel media descriptions as needed in subsequent SDP offers.

A DCMTSI client in terminal that desires to use data channels with stream IDs from a data channel application retrieved from its local bootstrap data channel stream ID 0 or 10, shall initiate a subsequent SDP offer after the initial SDP offer, opening those data channels by adding corresponding "a=dcmap", (optionally) "a=dcsa", and "a=3gpp-req-app" lines. A DCMTSI client in terminal that retrieves a data channel application from a stream ID different than 0 or 10 (e.g. a data channel application from the peer), shall not initiate any subsequent offer to open data channels used by that data channel application.

A data channel media description with specific loss or latency requirements should use "a=3gpp-qos-hint" in the SDP offer, as detailed in section 6.2.7.4. If subsequent SDP offers or answers adds data channels with more strict loss or latency requirements that cannot be met by keeping current "a=3gpp-qos-hint" and providing suitable SCTP "a=dcmap" parameters, the existing "a=3gpp-qos-hint" should be modified accordingly. Similarly, if subsequent SDP offers or answers closes (removes) data channels that are known to be the limiting factor for choosing the existing "a=3gpp-qos-hint", a more relaxed "a=3gpp-qos-hint" should be chosen to better fit the remaining data channels.

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| **2nd Change** |

### 6.2.12 The a=3gpp-req-app SDP attribute

6.2.12.1 General

When a DCMTSI client initiates the addition of data channel(s) to a call with a peer DCMTSI client for different applications, the SDP offer/answer shall identify the applications and which data channels are to be created for them by signalling the identification for that application via the "a=3gpp-req-app" attribute added to the media lines describing data channels for the application as discussed in section 6.2.10.1.

Both DCMTSI clients negotiating data channels for a call between them shall identify the application requesting data channel(s) to be established via the "a=3gpp-req-app" media-level SDP attribute that conveys a value set by the application launched on a UE, and configured on that application when it is made available for retreival via a bootstrap data channel. The "a=3gpp-req-app" attribute may also include an "endpoint" parameter to allow the UEs to identify the end points for the application data channels used for communication to a network server or to the remote UE. The combination of "req-app-id" and "endpoint" parameters allows the communicating UEs to bind the offers and answers for each data channel being negotiated for the identified application.

When the value of "req-app-id" parameter indicates the URL for the retrieval of the data channel application requesting data channel(s), the "a=3gpp-req-app" attribute shall include "req-app-id-format" paramter set to URL.

When applications already retrieved by a UE still need to be retrieved by the remote UE as part of a call upgrade (re-INVITE), the "a=3gpp-req-app" attribute may also include a 'bootstrap' parameter which identifies the bootstrap stream ID from where the remote UE receiving an SDP offer in a re-INVITE would retrieve the corresponding application.

#### 6.2.12.2 3gpp-req-app ABNF syntax and semantics

3gpp-req-app-value = req-app-id [endpoint] [";" req-app-id-format]\*(";" bootstrap) \*(";" 3gpp-req-app-opt)

req-app-id = quoted-string

endpoint = “ endpoint=” endpoint-id

endpoint-id = 1\*5DIGIT

req-app-id-format = "URL" / token

bootstrap = “bootstrap=” bootstrap-stream-id

bootstrap-stream-id = 1\*3DIGIT

3gpp-req-app-opt = token

quoted-string = DQUOTE \*(quoted-char / escaped-char) DQUOTE

quoted-char = SP / quoted-visible

quoted-visible = %x21 / %x23-24 / %x26-7E ; VCHAR without " or %

escaped-char = "%" HEXDIG HEXDIG

DQUOTE = <from RFC 5234>

token = <from RFC 4566>

##### 6.2.12.3 Creating an SDP offer

An "a=3gpp-req-app" line shall be included in any media description in an SDP offer that creates data channels for an application retreived via a local bootstrap data channel for communication to a remote end point, i.e., a remote UE or a network server. This attribute may also include an "endpoint" parameter to differentiate what that remote "endpoint" would be. It is the application responsibility to know which data flows is to use which data channels created for the application, as appropriate for the remote "endpoint". When the value of "req-app-id" parameter indicates the URL for the retrieval of the data channel application requesting data channel(s), the "a=3gpp-req-app" attribute shall include "req-app-id-format" paramter set to URL.

The retrieved applications are to be configured with an appropriate value for the "a=3gpp-req-app" line that is sufficiently unique to avoid ambiguity. The sending DCMTSI Client uses the value in this attribute to bind the media lines in the SDP describing data channels for the application. The application also assigns the endpoint identifications and uses them to differentiate the data channels to use for communication to the respective end points.

The "a=3gpp-req-app" line shall not be included for bootstrap data channels.

##### 6.2.12.4 Creating an SDP answer

A DCMTSI Client in terminal that desires to reject the entire SCTP assication for all offered data channels may include "a=3gpp-req-app" attribute from the SDP answer in the corresponding media description set the port to 0 (zero) in SDP.

A DCMTSI Client that desires to accept at least one offered data channel in a media description shall include an "a=3gpp-req-app" attribute. The value of "req-app-id" and "endpoint" parameters in the "a=3gpp-req-app" attribute shall be identical to the value used in the "a=3gpp-req-app" attribute for the media description in the offer.

A DCMTSI Client that received an SDP offer including IMS data channel media descriptions uses the application info in the "a=3gpp-req-app" line to identify the application for which the data channels are added/updated, formulates a corresponding SDP answer (especially the SCTP/DTLS transport parameters), and includes the same values for the "a=3gpp-req-app" and "endpoint" from the offer. The application on the answering DCMTSI Client should also be configured with the same values for the "req-app-id" and "endpoint" parameters and use the "endpoint" values to know which IMS data channels to use for the media directed to the respective end points.

##### 6.2.12.5 Offerer receiving an SDP answer

A DCMTSI Client that received an SDP answer including data channel media descriptions may use the application info in the "a=3gpp-req-app" line, along with the endpoint value, to identify the application for which the data channels are added and proceed to establish the SCTP/DTLS association for the apllication data channels.

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| **3rd Change** |

# A.17 SDP offers and answers with data channel capability signalling

The ellipsis ("...") in the examples in this clause is not part of the SDP but indicates possible presence of other media descriptions in addition to the ones shown in the examples.

Table A.17.1 demonstrates an example SDP offer with data channel capability signalling for the bootstrap data channel defined in clause 6.2.10. The offering part is an ICE Lite agent, indicated by "a=ice-lite" on SDP session level (i.e., before first m= line), and thus only offers host candidates, in this example a single host candidate aligned with address information on the corresponding m= and c= lines.

Table A.17.1: Example SDP offer with data channel capability signalling

|  |
| --- |
| **SDP offer** |
| a=ice-options:ice2a=ice-lite...m=application 52718 UDP/DTLS/SCTP webrtc-datachannel c=IN IP4 192.0.2.156b=AS:500a=candidate:1 1 UDP 2130706431 192.0.2.156 52718 typ hosta=ice-ufrag:8hhYa=ice-pwd:asd88fgpdd777uzjYhagZga=max-message-size:1024a=sctp-port:5000a=setup:actpassa=fingerprint:SHA-1 4A:AD:B9:B1:3F:82:18:3B:54:02:12:DF:3E:5D:49:6B:19:E5:7C:ABa=tls-id: abc3de65cddef001be82a=dcmap:0 subprotocol="http" |

An example SDP answer is shown in Table A.17.2, where the data channel capability signalling from Table A.17.1 is also supported and accepted by the answerer, as indicated by the non-zero port on the m= line. The answering part is an ICE Lite agent, indicated by "a=ice-lite" on SDP session level, and only supports ICE according to the predecessor ICE specification to [184] as indicated by no "a=ice-options:ice2" being included on SDP session level.

Table A.17.2: Example SDP answer with data channel capability

|  |
| --- |
| **SDP answer** |
| a=ice-lite...m=application 52718 UDP/DTLS/SCTP webrtc-datachannel c=IN IP4 192.0.2.1b=AS:500 a=candidate:1 1 UDP 2130706431 192.0.2.1 52718 typ hosta=ice-ufrag:9uB6a=ice-pwd:YH75Fviy6338Vbrhrlp8Yha=max-message-size:1024a=sctp-port:5002a=setup:passivea=fingerprint:SHA-1 5B:AD:67:B1:3E:82:AC:3B:90:02:B1:DF:12:5D:CA:6B:3F:E5:54:FAa=tls-id: dcb3ae65cddef0532d42a=dcmap:0 subprotocol="http" |

Table A.17.3 demonstrates an example SDP offer with multiple possible data channel application sources for the bootstrap data channel defined in Table 6.2.10.1-2. In this example, the offering part supports full ICE, indicated by no "a=ice-lite" on SDP session level.

Table A.17.3: Example SDP offer with multiple data channel application sources

|  |
| --- |
| **SDP offer** |
| a=ice-options:ice2...m=application 52718 UDP/DTLS/SCTP webrtc-datachannel c=IN IP6 fe80::6676:baff:fe9c:ee4ab=AS:500a=candidate:1 1 UDP 2130706431 fe80::6676:baff:fe9c:ee4a 52718 typ hosta=ice-ufrag:8hhYa=ice-pwd:asd88fgpdd777uzjYhagZga=max-message-size:1024a=sctp-port:5000a=setup:actpassa=fingerprint:SHA-1 4A:AD:B9:B1:3F:82:18:3B:54:02:12:DF:3E:5D:49:6B:19:E5:7C:ABa=tls-id: abc3de65cddef001be82a=dcmap:0 subprotocol="http"a=dcmap:10 subprotocol="http"a=dcmap:100 subprotocol="http"a=dcmap:110 subprotocol="http" |

An example SDP answer is shown in Table A.17.4, where only one of the the data channel application sources from the offer in Table A.17.3 is accepted by the answerer, removing the other a=dcmap lines.

Figure 6.2.10.1-3 in clause 6.2.10.1 may be used as illustration to this example, in which case UE A in that Figure would send the offer in Table A.17.3, and UE B would send the answer in Table A.17.4.

In this SDP answer, the answerer (UE B) only accepts stream ID 110 to receive the data channel application from the offerer (UE A), but UE B has rejected to use any other data channel application provider.

Table A.17.4: Example UE SDP answer choosing a single data channel application source

|  |
| --- |
| **SDP answer** |
| a=ice-options:ice2a=ice-lite...m=application 52718 UDP/DTLS/SCTP webrtc-datachannelc=IN IP4 192.0.2.1b=AS:500a=candidate:1 1 UDP 2130706431 192.0.2.1 52718 typ hosta=ice-ufrag:9uB6a=ice-pwd:YH75Fviy6338Vbrhrlp8Yha=max-message-size:1024a=sctp-port:5002a=setup:passivea=fingerprint:SHA-1 5B:AD:67:B1:3E:82:AC:3B:90:02:B1:DF:12:5D:CA:6B:3F:E5:54:FAa=tls-id: dcb3ae65cddef0532d42a=dcmap:110 subprotocol="http" |

Figure 6.2.10.1-3 in clause 6.2.10.1 may be used as illustration also to the example in Table A.17.5, in which case UE A in Figure 6.2.10.1-3 would send the offer in Table A.17.3, and the SDP answer sent back to UE A from the network would be the one in Table A.17.5.

In the SDP answer in Table A.17.5 sent from UE A’s (local) network, it is accepting stream ID 10 that would be used by UE A to receive its own, chosen data channel application, corresponding to the data channel application sent to UE B in stream ID 110 based on the SDP answer in Table A.17.4 such that both UEs can use the same application. That application is however received through different stream IDs for UE A and UE B, as shown in Figure 6.2.10.1-3.

 Table A.17.5: Example network SDP answer choosing a single data channel application source

|  |
| --- |
| **SDP answer** |
| a=ice-options:ice2a=ice-lite...m=application 52718 UDP/DTLS/SCTP webrtc-datachannelc=IN IP4 192.0.2.1b=AS:500a=candidate:1 1 UDP 2130706431 192.0.2.1 52718 typ hosta=ice-ufrag:9uB6a=ice-pwd:YH75Fviy6338Vbrhrlp8Yha=max-message-size:1024a=sctp-port:5010a=setup:activea=fingerprint:SHA-1 BC:8A:99:A0:E3:28:CA:B3:09:20:1B:FD:21:D5:AC:B6:F3:5E:45:AFa=tls-id: cd3bea56dced0f35d224a=dcmap:10 subprotocol="http" |

Table A.17.6 demonstrates an example SDP (re-)offer that adds two non-bootstrap data channel streams used by a new data channel application retrieved via the bootstrap data channel in Table A.17.5. The data channel application streams (two in this example) desire specific loss and latency characteristics indicated by the "a=3gpp-qos-hint" line (see also Annex A.16), and they also terminate on different endpoints, e.g., on a server and on the remote UE, hence theyare offered as a separate m= lines with different QoS requirements. The stream with ID 38754 has a strict latency requirement and data older than 150 ms will not be transmitted or re-transmitted. The stream with ID 7216 requires lower loss but can accept somewhat higher latency than stream ID 38754 and therefore allows at most 5 SCTP-level retransmissions. The application using these data channels is identified by the “a=3gpp-req-app” lines which also indicates that the two data channels are intended for communication with different end points, via the different "endpoint" values, e.g., a server versus the remote UE. The “a=3gpp-req-app” lines allow the remote UE to (re-)answer and accept the two new data channels for the application as Table A.17.7 illustrates. Table A.17.7 also suggest that the network used the "endpoint" values and resolved that the "endpoint" 1 is to be a server and provided its IP address on the corresponding media description.

Table A.17.6: Example SDP offer with data channel application streams

|  |
| --- |
| **SDP offer** |
| c=IN IP4 192.0.2.156a=ice-options:ice2a=ice-lite...m=application 52718 UDP/DTLS/SCTP webrtc-datachannelb=AS:500a=candidate:1 1 UDP 2130706431 192.0.2.156 52718 typ hosta=ice-ufrag:8hhYa=ice-pwd:asd88fgpdd777uzjYhagZga=max-message-size:1024a=sctp-port:5000a=setup:actpassa=fingerprint:SHA-1 4A:AD:B9:B1:3F:82:18:3B:54:02:12:DF:3E:5D:49:6B:19:E5:7C:ABa=tls-id: abc3de65cddef001be82a=dcmap:10 subprotocol="http"m=application 52720 UDP/DTLS/SCTP webrtc-datachannelb=AS:1000a=candidate:1 1 UDP 2130706431 192.0.2.156 52720 typ hosta=ice-ufrag:9uB6a=ice-pwd: YH75Fviy6338Vbrhrlp8Yha=max-message-size:1024a=sctp-port:5000a=setup:actpassa=fingerprint:SHA-1 BC:8A:99:A0:E3:28:CA:B3:09:20:1B:FD:21:D5:AC:B6:F3:5E:45:AFa=tls-id: cd3bea56dced0f35d224a=dcmap:7216 max-retr=5;label="low loss"a=3gpp-req-app:”application1” endpoint=1a=3gpp-qos-hint:loss=0.01;latency=100m=application 52724 UDP/DTLS/SCTP webrtc-datachannelb=AS:1000a=candidate:1 1 UDP 2130706431 192.0.2.156 52724 typ hosta=ice-ufrag:3cD2a=ice-pwd: YH75Fviy6338Vbrhrlrscta=max-message-size:1024a=sctp-port:5000a=setup:actpassa=fingerprint:SHA-1 BC:8A:99:A0:E3:28:CA:B3:09:20:1B:FD:21:D5:AC:B6:F3:5E:23:56a=tls-id: cd3bea56dced0f35e256a=dcmap:38754 max-time=150;label="low latency"a=3gpp-req-app:”application1” endpoint=2a=3gpp-qos-hint:loss=0.01;latency=100 |

**Table A.17.7: Example SDP answer with data channel application streams**

|  |
| --- |
| **SDP answer** |
| a=ice-options:ice2a=ice-lite...m=application 52718 UDP/DTLS/SCTP webrtc-datachannelc=IN IP4 192.0.2.1b=AS:500a=candidate:1 1 UDP 2130706431 192.0.2.1 52718 typ hosta=ice-ufrag:9uB6a=ice-pwd:YH75Fviy6338Vbrhrlp8Yha=max-message-size:1024a=sctp-port:5010a=setup:activea=fingerprint:SHA-1 BC:8A:99:A0:E3:28:CA:B3:09:20:1B:FD:21:D5:AC:B6:F3:5E:77:22a=tls-id: cd3bea56dced0f35f156a=dcmap:10 subprotocol="http"m=application 62347 UDP/DTLS/SCTP webrtc-datachannelc=192.0.2.126b=AS:500a=candidate:1 1 UDP 2130706431 192.0.2.126 62347 typ hosta=ice-ufrag:3pD2a=ice-pwd:YH75Fviy6338Vbrhrlrgb2a=max-message-size:1024a=sctp-port:5120a=setup:passivea=fingerprint:SHA-1 BC:8A:99:A0:E3:28:CA:B3:09:20:1B:FD:21:D5:AC:B6:F3:5E:CC:EEa=tls-id: cd3bea56dced0f35792ea=dcmap:38754 max-time=150;label="low latency"a=dcmap:7216 max-retr=5;label="low loss"a=3gpp-req-app:”application1” endpoint=1a=3gpp-qos-hint:loss=0.01;latency=100m=application 62357 UDP/DTLS/SCTP webrtc-datachannelb=AS:500a=candidate:1 1 UDP 2130706431 192.0.2.1 62357 typ hosta=ice-ufrag:3cBea=ice-pwd:YH75Fviy6338Vbrhrlhrtla=max-message-size:1024a=sctp-port:5130a=setup:passivea=fingerprint:SHA-1 BC:8A:99:A0:E3:28:CA:B3:09:20:1B:FD:21:D5:AC:B6:F3:5E:76:34a=tls-id: cd3bea56dced0f35514fa=dcmap:38754 max-time=150;label="low latency"a=dcmap:7216 max-retr=5;label="low loss"a=3gpp-req-app:”application1” endpoint=2a=3gpp-qos-hint:loss=0.01;latency=100 |

|  |
| --- |
| **4th Change** |

# M.12 3gpp-req-app

Contact name, email address, and telephone number:

 3GPP Specifications Manager

 3gppContact@etsi.org

 +33 (0)492944200

Attribute Name (as it will appear in SDP)

 3gpp-req-app

Long-form Attribute Name in English:

 IMS data channel binind ID attribute

Type of Attribute

 Media level

Is Attribute Value subject to the Charset Attribute

 This Attribute is not dependent on charset.

Purpose of the attribute:

 This attribute is used to identify an IMS application that uses IMS data channels.

Appropriate Attribute Values for this Attribute:

 See TS 26.114 clause 6.2.12.x for ABNF and detailed usage.

MUX Category for this Attribute:

 IDENTICAL