**3GPP TSG- Meeting #**

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| *CR-Form-v12.0* | | | | | | | | |
| **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:*** |  | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
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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 can be 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The description of media plane for IP connectivity is missing. Without that the specification of IP connectivity is incomplete. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding general description, functional entities and procedures for IP connectivity. The changes in this CR resolve that editors notes in CR0180 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Description of media plane for IP connectivity would be missing, which would lead to an incomplete specification of this functionality. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 4.1.x (new), 5.1.1 (new), 5.1.2 (new), 5.2, 5.3, 5.x, X (new), X.1 (new), X.1.1 (new), X.1.2 (new), X.1.3 (new), X.2 (new), X.3 (new), X.4 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \* \* \* \*

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.282: "Functional architecture and information flows to support Mission Critical Data (MCData) Stage-2".

[3] 3GPP TS 23.280: "Common functional architecture to support mission critical services Stage-2".

[4] 3GPP TS 24.481: "Mission Critical Services (MCS) group management; Protocol Specifications".

[5] 3GPP TS 24.482: "Mission Critical Services (MCS) identity management; Protocol Specifications".

[6] 3GPP TS 24.483: "Mission Critical Services (MCS) Management Object (MO)".

[7] 3GPP TS 24.484: "Mission Critical Services (MCS) configuration management; Protocol Specifications ".

[8] 3GPP TS 24.282: "Mission Critical Services (MCS) signalling control; Protocol Specifications ".

[9] IETF RFC 2046 (November 1996): "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types".

[10] IETF RFC 4122 (July 2005): "A Universally Unique IDentifier (UUID) URN Namespace".

[11] IETF RFC 4975 (September 2007): "The Message Session Relay Protocol (MSRP)".

[12] IETF RFC 6135 (February 2011): "An Alternative Connection Model for the Message Session Relay Protocol (MSRP)".

[13] IETF RFC 6714 (August 2012): "Connection Establishment for Media Anchoring (CEMA) for the Message Session Relay Protocol (MSRP)".

[14] IETF RFC 4976 (September 2007): "Relay Extensions for the Message Session Relay Protocol (MSRP)".

[15] 3GPP TS 33.180: "Security of mission critical services".

[16] IETF RFC 3550 (July 2003): "RTP: A Transport Protocol for Real-Time Applications".

[17] IETF RFC 3711 (March 2004): "The Secure Real-time Transport Protocol (SRTP)".

[18] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[19] IETF RFC 2784 (March 2000): "Generic Routing Encapsulation (GRE)

[20] IETF RFC 2790 (September2000): "Key and Sequence Number Extensions to GRE

\* \* \* End of Change \* \* \* \*

\* \* \* Next Change \* \* \* \*

### 4.1.x IP Connectivity

The media plane control procedures for one-to-one using media plane, take place for on-network only. The media plane for IP Connectivity is established and terminated as specified in 3GPP TS 24.282 [8].

The media plane uses the IP protocol as specified in RFC 790 , RFC 791, and RFC 8200.

The IP Connectivity for the media plane is established by the originating MCData client as specified in this document.

IP Connectivity provides a media plane for exchange of any kind of IP data between IP applications. Once the media plane is established along with IP Connectivity the IP applications can exchange IP data.

\* \* \* End of Change \* \* \* \*

\* \* \* Next Change \* \* \* \*

## 5.1 General for MCData functional entities

### 5.1.1 General MCData functional entities for SDS and FD

Media plane control is conducted between the MCData server and MCData UE. MCData server has capability functions for SDS and FD. MCData UE incorporates the MCData client. MCData user or MCData user application may feed or consume data transmitted or received via the capability functions in the MCData client. The capability function in the MCData client provides SDS and FD services.

The capability functions of the MCData server are specified for the controlling MCData function and the participating MCData function. The capability functions of the MCData UE are specified for the MCData client.

Data to be transmitted either by the MCData user or by a MCData user application using media plane shall be transmitted by the MCData client to the participating MCData function. The participating MCData function shall forward the data to the controlling MCData function. The controlling MCData function shall distribute the data to the destination MCData client for one-to-one MCData service and to the MCData clients of the affiliated group members for group MCData service via the participating MCData functions serving each destination MCData client. A participating MCData function may serve one or more MCData clients. Based on deployment, controlling MCData function may be in communication with zero, one or more participating MCData functions. If a participating MCData function is collocated with the controlling MCData function, the controlling MCData function may perform the functions of this co-located participating MCData function. In this case the controlling MCData function and this co-located participating MCData function shall act as a single entity.

In the media plane the MCData client and the controlling MCData function shall act as MSRP clients. If and when a participating MCData function is in the communication path as a separate entity between the controlling MCData function and one or more MCData clients, it shall act as an MSRP relay.

\* \* \* End of Change \* \* \* \*

\* \* \* Next Change \* \* \* \*

### 5.1.2 General MCData functional entities for IP Connectivity

IP Connectivity provides a media plane for exchange of any kind of IP data between IP applications. These IP applications may reside on an external non-3GPP hosts connected via an IP interface to the MCData UE that incorporates the MCData client, or they may be co-located on the MCData UE. The participating MCData function and the controlling MCData functions shall be in the path of the data exchange between the authorized MC Data users,

\* \* \* End of Change \* \* \* \*

\* \* \* Next Change \* \* \* \*

## 5.2 Functional entities for SDS

The capability function for SDS for media plane in the MCData server is composed of SDS distribution function and the Transmission/Reception control. In the media plane the functions of SDS distribution and the Transmission/Reception control are specified for the controlling MCData function and the participating MCData function. The functions of the SDS are specified for the SDS function in MCData client.

For SDS, data is composed of short data in the form of text, hypertext, binary string or location information. Short data generated in the MCData client and sent using media plane follows the path for the originating MCData client to the terminating MCData clients as explained in subclause 5.1.1

## 5.3 Functional entities for FD

The capability function for FD for media plane in the MCData server is composed of FD function and the Transmission/Reception control. The file distribution over media plane functionalities in the MCData server are specified for the controlling MCData function and the participating MCData function. The functions of the FD are specified for the FD function in the MCData client.

For FD, data is composed of a file. A file provided at the MCData client and sent using media plane follows the path from the originating MCData client to the terminating MCData clients as explained in subclause 5.1.1

\* \* \* End of Change \* \* \* \*

\* \* \* Next Change \* \* \* \*

## 5.x Functional entities for IP Connectivity

For IP Connectivity, the data that is transmitted consists of any kind of IP data. IP Connectivity data is sent by the MCData client using media plane from the originating MCData client to the terminating MCData client as explained in subclause 5.1.2.

\* \* \* End of Change \* \* \* \*

\* \* \* Next Change \* \* \* \*

# X IP Connectivity media plane procedures

## X.1 IP Connectivity client procedures

### X.1.1 General

For IP Connectivity the endpoint of the media plane is an IP application that can send and receive any kind of IP messages. The IP application may reside on an external non-3GPP host connected via an IP interface to the MCData UE that incorporates the MCData client, or it may be co-located on the MCData UE. If the IP application resides on an external non-3GPP host, the MCData UE that incorporates the MCData client, it shall provide a second IP interface with an IP address independent of the 3GPP system for communication to the external non 3GPP host. The IP interface between the IP application and the MCData UE and MCData client is based on implementation.

### X.1.2 Originating MCData client procedures

Upon receiving a request by an MCData user, or an IP packet from an IP application, the MCData client shall follow the procedure in 20.2.1 in 3GPP TS 24.282 [8]. The IP address received in the 200 Ok response in this procedure shall be used to establish an IP tunnel. The IP tunnel shall be based on Generic Routing Encapsulation (GRE) as explained in subclause X.4. The Key field value of each GRE packet header uniquely identifies the IP connectivity session that the GRE packet payload is associated with. The MCData client shall act as an IP relay for IP traffic between the IP application and the IP tunnel to the far endpoint. Once the IP tunnel is established, the IP applications can exchange IP data. The client that receives the IP packets from the IP application shall perform encapsulation to the tunnelling protocol, while the client that receives IP packets from the IP tunnel shall perform de-encapsulation from the tunnelling protocol before passing the IP data to the IP application.

### X.1.3 Terminating MCData client procedures

The successful outcome of the procedure 20.2.2 in 3GPP TS 24.282 [8] shall be the trigger to start the establishment of the IP tunnel. The IP tunnel shall be based on Generic Routing Encapsulation (GRE) as explained in subclause X.4. The Key field value of each GRE packet header uniquely identifies the IP connectivity session that the GRE packet payload is associated with. The MCData client shall act as an IP relay for IP traffic between the IP tunnel and the IP application. Once the IP tunnel is established, the IP applications can exchange IP data. The client that receives the IP packets from the IP application shall perform encapsulation to the tunnelling protocol, while the client that receives IP packets from the IP tunnel shall perform de-encapsulation from the tunnelling protocol before passing the IP data to the IP application.

## X.2 Participating MCData function procedures

The participating MCData function shall provide an endpoint for an IP tunnel towards the MCData client, and a second endpoint for an IP tunnel towards the controlling MCData function. Once the IP tunnel from the MCData client is established, the participating MCData function shall establish a second IP tunnel towards the controlling MCData function. The IP tunnel shall be based on Generic Routing Encapsulation (GRE) as explained in subclause X.4. The Key field value of each GRE packet header uniquely identifies the IP connectivity session that the GRE packet payload is associated with. Additionally the participating MCData function shall act as an IP relay for the IP traffic between these two IP tunnels.

## X.3 Controlling MCData function procedures

The controlling MCData function shall provide an endpoint for an IP tunnel towards the MCData originating participating MCData function, and a second endpoint for an IP tunnel towards the terminating participating MCData function. Additionally the controlling MCData function shall act as an IP relay for the IP traffic between these two IP tunnels.

## X.4 Encapsulation of the user data in the GRE tunnel

GRE encapsulated user data packet is coded according to figure X.4-1 and table X.4-1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | |  |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Octets |
| GRE header | | | | | | | | 1 - 8 |
| Payload packet | | | | | | | | 9 - x |

Figure X.4-1: GRE encapsulated user data packet

Table X.4-1: GRE encapsulated user data packet

|  |
| --- |
| Octet 1 to octet 8 are the GRE header field defined in IETF RFC 2784 [19] and IETF RFC 2890 [20]. The GRE header field is coded according to figure X.4-2 and table X.4-2. |
| Octet 8 to octet x are the Payload packet field. The Payload packet field contains one user data packet. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | |  |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Octets |
| C | Reserved0 | K | S | Reserved0 | | | | 1 |
| Reserved0 | | | | | Ver | | | 2 |
| Protocol type | | | | | | | | 3 - 4 |
| Key | | | | | | | | 5 - 8 |

Figure X.4-2: GRE header field

Table X.4-2: GRE header field

|  |
| --- |
| Bit 7 of octet 1 is the C bit defined in IETF RFC 2784 [19]. The C bit is set to zero. |
| Bits 6, 3, 2, 1 and 0 of octet 1 and bits 7, 6, 5, 4, and 3 of octet 2 are the Reserved0 field defined in IETF RFC 2784 [19] and IETF RFC 2890 [20]. |
| Bit 5 of octet 1 is the K bit defined in IETF RFC 2890 [20]. The K bit is set to one. |
| Bit 4 of octet 1 is the S bit defined in IETF RFC 2890 [20]. The S bit is set to zero. |
| Bits 2, 1 and 0 of octet 2 is the Ver field defined in IETF RFC 2784 [19]. |
| Octet 3 and octet 4 are the Protocol Type field defined in IETF RFC 2784 [19]. The Protocol Type field is set to zero. (see NOTE) |
| Octet 5 to octet 8 are the Key field defined in IETF RFC 2890 [20]. The Key field is coded according to figure X.4-3 and table X.4-3. |
| NOTE: The receiving entity shall ignore value of the Protocol Type field. |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | |  |
| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | Octets |
| 0  Spare | 0  Spare | QFI | | | | | | 5 |
| 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 6 |
| 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 7 |
| RQI | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 0  Spare | 8 |

Figure X.4-3: Key field of GRE header

Table X.4-3: Key field of GRE header

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| RQI (octet 8, bit 7) | | | | | | | |
| Bit | | | | | | | |
| 7 | | | | | | | |
| 0 |  | RQI is not indicated | | | | | |
| 1 |  | RQI is indicated | | | | | |
|  | | | | | | | |
| QFI (octet 5, bits 5 to 0) | | | | | | | |
| Bits | | | | | | | |
| 5 | 4 | 3 | 2 | 1 | 0 |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 |  | QFI 0 |
| to | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | 1 |  | QFI 63 |
|  | | | | | | | |

\* \* \* End of Change \* \* \* \*

\* \* \* End of Changes \* \* \* \*