**3GPP TSG-CT1 Meeting #136-e *C1-223508***

**Online, ,****6th – 12th May 2022**  **(was C1-223106)**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **24.582** | **CR** | **0032** | **rev** | **2** | **Current version:** | **17.1.0** |  |
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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:***  | Add support of multiple IPConn communications |
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| ***Source to WG:*** | Kontron Transportation France |
| ***Source to TSG:*** | C1 |
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| ***Work item code:*** | eMONASTERY2 |  | ***Date:*** | 2022-04-28 |
|  |  |  |  |  |
| ***Category:*** | A |  | ***Release:*** | Rel-17 |
|  | *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:*** | The current specification for MCData IP connectivity does not support handling multiple simultaneous IP connectivity communications. This CR adds the required changes. |
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| ***Summary of change:*** | * Added RFC8086 GRE-in-UDP Encapsulation to references
* Update 13.1.2 with use of GRE-in-UDP and IP address and port to use
* Update 13.1.3 with use of GRE-in-UDP IP address and port to use
* Add to 13.2.1 handling of the UDP traffic
* Add to 13.2.2 handling of the UDP traffic
* Add to 13.3 handling of the UDP traffic
* Change in 13.4 GRE to GRE-in-UDP
* Add 13.5 with media plane details
* Add 13.6 with SDP details
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| ***Consequences if not approved:*** | MCData IP connectivity will not be able to handle multiple simultaneous communications |
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| ***Clauses affected:*** | 2, 13.1.1, 13.1.2, 13.1.3, 13.2.1, 13.2.2, 13.3, 13.4, 13.5 (new), 13.5.1 (new), 13.5.2 (new), 13.5.2.1 (new), 13.6 (new), 13.6.1 (new), 13.6.2 (new), 13.6.2.1 (new), 13.6.2.2 (new), 13.6.2.3 (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 ...  |
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| ***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.

[21] IETF RFC 791 (September 1981) "INTERNET PROTOCOL".

[22] IETF RFC 8200 (July 2017) "Internet Protocol, Version 6 (IPv6) Specification".

[23] IETF RFC 8086 (March 2017) "GRE-in-UDP Encapsulation

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

### 13.1.1 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 running on the MCData UE. If the IP application resides on an external non-3GPP host, the MCData UE that incorporates the MCData client provides a second IP interface with an IP address independent of the 3GPP system for communication with the external non 3GPP host. The IP interface between the IP application, the MCData UE and the MCData client is implementation specific.

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

### 13.1.2 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 20.2.3 in 3GPP TS 24.282 [8]. The IP address and port number received in the SDP payload of the 200 OK response in this procedure shall be used to establish an IP tunnel. The IP tunnel shall be based on GRE-in-UDP Encapsulation as specified in IETF RFC 8086 [23], and as specified in clause 13.4. Generic Routing Encapsulation (GRE) as specified in IETF RFC 2784 [19] is used as a basis of GRE-in-UDP Encapsulation.

The MCData client shall perform encapsulation and decapsulation according to clause 13.4.

The MCData client acts 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 MCData client that receives the IP packets from the IP application shall perform encapsulation to the tunnelling protocol adding a GRE header and a UDP header to the IP packet, and send the outgoing UDP traffic to the IP address and port present in the SDP answer. When the originating MCData client receives IP packets from the IP tunnel it shall perform de-capsulation from the tunnelling protocol, removing the UDP header and the GRE header from the received packet, before passing the IP data to the IP application.

### 13.1.3 Terminating MCData client procedures

The successful outcome of the procedure 20.2.4 in 3GPP TS 24.282 [8] shall be the trigger to start the establishment of the IP tunnel. The IP tunnel is based on GRE-in-UDP Encapsulation as specified in IETF RFC 8086 [23], and as specified in clause 13.4.

The MCData client shall perform encapsulation and decapsulation in accordance with clause 13.4.

The MCData client acts 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 IP packets from the IP tunnel shall perform de-capsulation from the tunnelling protocol, removing the UDP header and the GRE header from the received packet, before passing the IP data to the IP application. When the terminating MCData client receives an IP packet from the IP application, it shall perform encapsulation to the tunnelling protocol adding a GRE header and a UDP header to the IP packet, and send the outgoing UDP traffic to the IP address and port present in the SDP offer.

## 13.2 Participating MCData function procedures

### 13.2.1 Originating procedures

The originating participating MCData function shall provide an endpoint for UDP based communication towards the originating MCData client, and a second endpoint for UDP based communication towards the controlling MCData function. The originating participating MCData function shall act as a relay for the UDP traffic between these two adjacent UDP communication endpoints using the IP addresses and UDP ports exchanged in the SDP offers/answers.

### 13.2.2 Terminating procedures

The terminating participating MCData function shall provide an endpoint for UDP based communication towards the terminating MCData client, and a second endpoint for UDP based communication towards the controlling MCData function. The terminating participating MCData function shall act as a relay for the UDP traffic between these two adjacent UDP communication endpoints using the IP addresses and UDP ports exchanged in the SDP offers/answers.

## 13.3 Controlling MCData function procedures

The controlling MCData function shall provide an endpoint for UDP based communication towards the MCData originating participating MCData function, and a second endpoint for UDP based communication towards the terminating participating MCData function. The controlling MCData function shall act as a relay for the UDP traffic between these two adjacent UDP Communication endpoints using the IP addresses and UDP ports exchanged in the SDP offers/answers.

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

## 13.4 Encapsulation of the user data in the GRE-in-UDP tunnel

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The Encapsulation of the user data in the GRE-in-UDP tunnel shall be performed as defined in IETF RFC 8086 [23] with the following clarifications:

1) UDP checksum shall be used when encapsulating in both IPv4 and IPv6;

2) The UDP ports can be freely chosen. The port information is exchanged via SDP; and

3) GRE keys shall not be used.

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

## 13.5 Media plane details

### 13.5.1 General

The media plane is used for transport of data via the GRE-in-UDP tunnel as specified in the present clause.

### 13.5.2 Establishing a media plane for a GRE-in-UDP tunnel

#### 13.5.2.1 General

The MCData client and the MCData server use the SDP offer/answer mechanism in order to negotiate the establishment of the media plane for a GRE-in-UDP tunnel.

The media description ("m=" line) associated with the media plane of the GRE-in-UDP tunnel shall have the values as described in table 13.5.2.1-1.

Table 13.5.2.1-1: GRE-in-UDP tunnel media description

|  |  |
| --- | --- |
| Media description element | Value |
| <media> | "application" |
| <port> | UDP port |
| <proto> | "udp" |
| <fmt> | "MCDATA |

The format of the optional SDP fmtp attribute, when associated with the GRE-in-UDP ports, is described in clause 13.6.

The example below shows an SDP media description for MCData IP Connectivity media plane

m=application 20032 udp MCDATA

a=fmtp:MCDATA mcdata-ipconn

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

## 13.6 Session description types defined within the present document

### 13.6.1 General

This clause contains definitions for SDP parameters that are specific to SDP usage with MCData IP connectivity and therefore are not described in an IETF RFC.

### 13.6.2 SDP "fmtp" attribute for MCData IP connectivity

#### 13.6.2.1 General

This clause defines the structure and syntax of the SDP "fmtp" attribute, when used to negotiate the ports used for GRE-in-UDP tunnel establishment.

#### 13.6.2.2 Semantics

In an SDP offer and answer, the "mcdata-ipconn-s-port" fmtp attribute is used to indicate the UDP source port of the GRE-in-UDP tunnel.

#### 13.6.2.3 Syntax

Table 13.6.2.3-1: SDP "fmtp" attribute for the MCData IP connectivity

fmtp-attr-ipconn = "a=fmtp:" "MCDATA" SP attr-param

attr-param = mcdata-ipconn-s-port

mcdata-ipconn-s-port = "mcdata-ipconn-s-port=1\*(DIGIT)"

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