**3GPP TSG-SA WG6 Meeting #60 S6-241333**

**Changsha, China 15th – 19th April 2024 (revision of S6-241083)**

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| *CR-Form-v12.1* | | | | | | | | |
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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:*** | MC gateway UE updates for security alignment | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Motorola Solutions, Huawei, Hisilicon, Nokia, AT&T | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MCGWUE | | | | |  | ***Date:*** | | | 2024-04-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This CR reflects the necessary updates to be done in 3GPP TS 23.280 related to MC gateway UE based on the LS reply from SA3 in S6-240551. Furthermore, it reflects the agreement to have MBMS and location reporting support as part of release 19. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. voiding the (dis-) connection authorisation procedures in clause 11.5.1 and 11.5.4  2. voiding the MBMS and location reporting support related procedures in clauses 11.5.2 and 11.5.3 (for release 18 only)  3. update the texts in the other clauses, e.g., the functionalities in clause 11.1 and 11.2, etc, to reflect the changes mentioned above  2. update the functional model in clause 11.2 to reflect the LS reply mentioned earlier  4. adding a new figure in clause 11.2 to describe the functional model to support non-3GPP devices that cannot host an MC client.  5. remove the GW-core and GW-local reference points, and removing the MC gateway UE media forwarding function.  6. voiding the MC gateway UE initial configuration in clause A.7 (only in Rel-18)  7. voiding the GW MC service ID in clause 8.1.7  8. updating figures 11.2.0-1 and 11.2.0-2  9. voiding clause 11.4, and adding the content in a new annex  10. the content of clause 11.3.2 is voided and EN is added | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Violating security mechanism described by SA3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 8.1.7, A.7, 11.1, 11.2.0, 11.2, 11.2.1, 11.3, 11.3.1, 11.3.2, 11.3.3, 11.4, 11.4.1, 11.4.2, 11.5, 11.5.1, 11.5.2, 11.5.3, 11.5.4, A.7, D.1, D.2 and E (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 \* \* \* \*

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1]. Not all definitions are used in this document.

**Accuracy:** Reflects the uncertainty of the location at the moment of location measurement, e.g. see 3GPP TS 25.305 [30] and 3GPP TS 23.032 [31].

**ACM:** Administrative Configuration Management, which enables the exchange of administrative configuration data between interconnected MC systems.

**ACMC:** Administrative Configuration Management Client, client entity which initiates administrative configuration exchange request to an interconnected partner MC system and which could make decision on such request received from an ACMC of a partner MC system.

**ACMS:** Administrative Configuration Management Server, server entity which receives administrative configuration exchange requests from an ACMC belonging to the same primary MC system or via an ACMS of an interconnected partner MC system.

**Active MC service user profile:** The MC service user profile that is currently used by an MC service client of an MC service user while receiving MC service.

**Ad hoc Group Communication**: The combining of a multiplicity of MC service users into a group for the duration of a communication. When the communication is released, the group no longer exists. If the communication is associated with an alert, then the group continues to exist until the alert is also cancelled.

**Ad hoc Group emergency alert**: The combining of a multiplicity of MC service users into a group for sending an emergency alert. When the alert is cancelled, the group no longer exists. If the alert is associated with a communication, then the group continues to exist until the communication is also cancelled.

**Altitude:** Third dimension for the geographical coordinates at the moment of location measurement, e.g. see 3GPP TS 25.305 [30] and 3GPP TS 23.032 [31].

**Bearing:** Direction at the moment of location measurement, e.g. see 3GPP TS 25.305 [30].

**Chat group:** An MC service group that is pre-defined with MC service group ID and member list in the group management server. Group members must join the pre-established group call to participate.

**ECGI:** E-UTRAN Cell Global Identifier, which is used to identify cells globally, where the ECGI is constructed from the Mobile Country Code (MCC), Mobile Network Code (MNC) and the E-UTRAN Cell Identifier (ECI).

**Interconnection:** A means of communication between MC systems whereby MC service users obtaining MC service from one MC system can communicate with MC service users who are obtaining MC service from one or more other MC systems.

**Interconnection group:** An MC service group that is configured to allow inclusion of MC service group members who are MC service users from partner MC system(s).

**LCS network:** The 3GPP network that provides location service as defined in 3GPP TS 23.271 [29].

**Location:** The current physical location of the MC service UE.

**MBMS SAI:** Multimedia Broadcast Multicast Service Area Identity which is mapped to the MBMS service area.

**MC gateway server:** A server providing topology hiding for MC service interconnection with a partner MC system, where that partner MC system is in a different trust domain.

**MC service:** A generic name for any one of the three mission critical services: either MCPTT, or MCVideo, or MCData.

**MC service affiliated group member:** An MC service user who has indicated an interest in a particular MC service group and has been accepted to participate in MC service group communication for that MC service group.

**MC service client:** A generic name for the client application function of a specific MC service. MC service client could be replaced by MCPTT client, or MCVideo client, or MCData client depending on the context.

**MC service group:** A defined set of MC service users with associated communication dispositions (e.g. media restrictions, default priority and commencement directions) configured for the use with one or more MC services.

**MC service group affiliation:** A mechanism by which an MC service user's MC service(s) communication interest in one or more MC service groups is determined.

**MC service group call:** A mechanism by which an MC service user can make a one-to-many MC service(s) transmission to other users that are members of MC service group(s).

**MC service group de-affiliation:** A mechanism by which an MC service user's MC service(s) communication interest in one or more MC service groups is removed.

**MC service group home system:** The MC system where the MC service group is defined.

**MC service group host MC service server:** The MC service server within an MC system which provides centralised support for a particular MC service of an MC service group defined in a MC service group home system.

**MC service group member:** An MC service user, whose MC service ID is listed in a particular MC service group.

**MC service ID:** A generic name for the user ID of a mission critical user within a specific MC service. MC service ID could be replaced by MCPTT ID, or MCVideo ID, or MCData ID depending on the context.

**MC service server:** A generic name for the server application function of a specific MC service. MC service server could be replaced by MCPTT server, MCVideo server, or MCData server depending on the context.

**MC service user:** An authorized user, who can use an MC service UE to participate in one or more MC services.

**MC service user profile:** The set of information associated to an MC service user that allows that user to employ one or more MC services in a given role and from a given MC service UE.

**MC service UE:** A UE that can be used to participate in one or more MC services.

**MC service UE label:** A generic name for identification of a specific MC service UE.

**MC system:** The collection of applications, services, and enabling capabilities required to provide a single mission critical service or multiple mission critical services to one or more mission critical organizations.

**MC user:** A user, identified by an MC ID, who, after authorization, obtains mission critical service(s).

**Migration:** A means for an MC Service user to obtain MC service directly from a partner MC system.

**Partner MC system:** Allied MC system that provides MC services to an MC service user based on the MC service user profiles that are defined in the primary MC system of that MC service user.

**Preconfigured MC service group:** an MC service group used only for regrouping that has been configured in advance of a group or user regrouping operation to serve as the source of regroup group configuration.

**Pre-arranged group:** An MC service group that is pre-defined with MC service group ID and member list in the group management server. Affiliated group members are invited when the group communication is setup.

**Pre-selected MC service user profile:** The MC service user profile that is to be selected as the active MC service user profile through configuration, and applicable for an authenticated MC service user upon MC service authorization.

**Primary MC system:** MC system where the MC service user profiles of an MC service user are defined.

**Requested Priority:** A value for use in a MC service group or MC private communication that, if accepted, is used by the MCX service server to temporarily replace the priority level that is predefined in the MC service group or MC service user profile. This value is used in combination with other factors to determine the application priority for the requested communication.

**Selected MC service user profile:** The MC service user profile that is to be selected as the active MC service user profile for an MC service upon request by an MC service user.

**Serving MC service server:** The MC service server which is providing MC service to an MC service client.

NOTE 1: There is one serving MC service server for each MC service, which can be the primary MC service server of the MC service user of the MC service client, or can be a partner MC service server to which the MC service user has migrated.

**Serving MC system:** The MC system which is providing MC service to an MC user.

NOTE 2: The MC system can be the primary MC system of the MC service user, or can be a partner MC system to which the MC service user has migrated.

**Speed:** Movement at the moment of location measurement, e.g. see 3GPP TS 25.305 [30] and 3GPP TS 23.032 [31].

**Time of measurement:** Date and time expressed with a certain precision to reflect the moment of the location measurement.

For the purposes of the present document, the following terms given in 3GPP TS 22.280 [3] apply

**Mission Critical**

**Mission Critical Applications**

**Mission Critical Organization**

**Mission Critical Service**

**Functional alias**

For the purposes of the present document, the following terms given in 3GPP TS 22.179 [2] apply

**Multi-talker control**

**Group-broadcast group**

For the purposes of the present document, the following terms related to a MC gateway UE function apply

**MC gateway UE:** A functional entity that enables simultaneous access to the MC system for multiple MC clients.

**MC client:** Aggregates a set of clients (i.e. Group management client, Configuration management client, Identity management client, Key management client, Location management client and MC service client).

**MC server:** Aggregates a set of servers (i.e. Group management server, Configuration management server, Identity management server, Key management server, Location management server and MC service server) which serves the MC client accordingly.

**Non-3GPP device:** A device that enables connectivity towards an MC gateway UE using an access method not specified by 3GPP. A subset of these devices can host an MC client specified by 3GPP.

\* \* \* \* Second change \* \* \* \*

### 8.1.7 Void

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

# 11 MC gateway UE

## 11.1 General

An MC gateway UE enables MC service access for a MC service user residing on non-3GPP devices which may or may not have the ability to host MC service clients. In order to be able to participate in a MC service, the MC gateway UE provides the following necessary functions to enable the MC service access for such MC clients:

- **3GPP transport resources**: Sharing of MC gateway UE 3GPP transport resources among the associated MC service clients.

- **MC client identification**: Independent MC service client identification, MC service client authorisation and MC service profile association.

- **MC client communication integrity**: Ensure that signalling, media content and traffic attributes, e.g. priority and QoS, of communications between the MC system and MC service client remains unaltered.

- **Transparent MC traffic forwarding**: The MC gateway UE forwards MC traffic without altering the content to the non-3GPP device whether it hosts or does not host an MC client. For the case the MC client is hosted at the non-3GPP device, the MC gateway UE forwards:

- the signalling between the MC client in the non-3GPP device and the MC service server/ CSC server

- the signalling between the user agent in the non-3GPP device and the SIP core

- the signalling between the HTTP client in the non-3GPP device and the HTTP proxy

- the media between the MC service server and the MC client in the non-3GPP device

NOTE 1: The traffic exchange between the non-3GPP device and the MC gateway UE is implementation specific.

NOTE 2: Information related to MC gateway UE routing capabilities is found in Annex E.

NOTE 3: Information about MC gateway UE selection are summarized in Annex D.

## 11.2 Functional Model

### 11.2.0 General

The MC gateway UE offers access to the MC server for several MC clients as shown in Figure 11.2.0-1. The MC clients can be either located in the MC gateway UE or in the non-3GPP devices connected to the MC gateway UE via non-3GPP access.

For non-3GPP devices which can host an MC client, the MC gateway UE enables connectivity to the MC server. For non-3GPP devices which cannot host the MC client, the MC gateway UE hosts the instantiation of the MC client on behalf of the non-3GPP device.



Figure 11.2.0-1: Functional architecture

The MC gateway UE obtains MC service access via 3GPP network using the procedures as defined in 3GPP TS 33.180 [25].

The non-3GPP connection between the non-3GPP device and the MC gateway UE is out of scope of 3GPP.

For non-3GPP devices which cannot host MC clients, the MC gateway UE instantiates an MC client, acting on behalf of the non-3GPP device, to provide the requested services (e.g. emergency call, group calls, short data messages services, etc.). The communication interworking and the definition of associated procedures between the MC client (initiated at the MC gateway UE) and the non-3GPP devices is out of scope of this document.

For non-3GPP devices that host MC clients, MC service access is through the MC gateway UE. The MC gateway UE forwards (unmodified) signalling and media from the individual MC clients to the MC server and vice versa.

If the MC service user on the non-3GPP device utilizes multiple MC services simultaneously, the MC service access may also be provided via one or multiple MC gateway UEs as shown in figure 11.2.0-2. In this case, each MC service is restricted to one MC gateway UE (e.g., MCPTT via MC gateway UE1, MCData via MC gateway UE2).



Figure 11.2.0-2: Simultaneous multiple MC gateway UE use by a single non-3GPP device

NOTE 2: Although not shown in the above figure, the same principle of simultaneous use of multiple MC gateway UEs is applied for non-3GPP devices which cannot host an MC client.

### 11.2.1 Functional model

The authentication and authorisation of the MC clients hosted on the MC gateway UE follows the procedures described in 3GPP TS 33.180 [25]. Upon successful authentication and authorisation the MC clients can access a MC server via an MC gateway UE.

The MC gateway UE supports the authentication and authorisation of the MC client residing at the non-3GPP device by forwarding the unmodified application layer signalling between the MC client and the corresponding MC server. The authentication and authorisation of the MC client in the non-3GPP device follows the procedures described in 3GPP TS 33.180 [25].

NOTE: The authentication and authorisation between the MC gateway UE and the non-3GPP device is out of scope of 3GPP.

Figure 11.2.1-1 represents the functional model for the application plane for utilizing MC gateway UE to enable MC services to non-3GPP devices that can host an MC client.

Figure 11.2.1-2 represents the functional model for the signalling plane for utilizing MC gateway UE to enable MC services to non-3GPP devices that can host an MC client.

Figure 11.2.1-3 represents the functional model for the application plane for non-3GPP devices that cannot host an MC client.



Figure 11.2.1-1: Functional model of MC gateway UE application plane with MC client hosted in the non- 3GPP device



Figure 11.2.1-2: Functional model of MC gateway UE signalling plane with MC client hosted in the non- 3GPP device



Figure 11.2.1-3: Functional model of MC gateway UE application plane with MC client hosted in the MC gateway UE

The functional model for the signalling control plane as described in figure 7.3.1-2 is applicable to figure 11.2.1-3.

11.2.2 Reference points

#### 11.2.2.1 General

The reference points for the use of the MC gateway UE are described in the following subclauses.

#### 11.2.2.2 Void

#### 11.2.2.3 Void

#### 11.2.2.4 Reference points MCX-n, CSC-n, SIP-1 and HTTP-1

The reference points MCX-n and CSC-n belonging to the application plane, and the reference points SIP-1 and HTTP-1 belonging to the signalling control plane, are relayed by the MC gateway UE between MC client on the non-3GPP device and the corresponding MC service server.

MCX-n, CSC-n, SIP-1 and HTTP-1 reference points are specified in the present specification. The MCX-n reference points are specified in 3GPP TS 23.379 [16], 3GPP TS 23.281 [12] and 3GPP TS 23.282 [13].

NOTE: The MCPTT-8, MCPTT-9, MCVideo-8, MCVideo-9, MCData-FD-5 are not included within MCX-n.

11.2.3 Void

## 11.3 Using identities behind the MC gateway UE

### 11.3.1 General

The MC gateway UE enables access to the MC system for MC clients either hosted on the MC gateway UE or hosted on non-3GPP devices. MC clients hosted in a non-3GPP device utilize MC service identities that are transparently passed through the MC gateway UE. This is further illustrated in subclause 11.3.2.

MC clients hosted in MC gateway UE also utilize unique MC service identities and share one common IMS subscription that is unique for MC gateway UE. This is further illustrated in subclause 11.3.3.

### 11.3.2 When using separate IMS subscriptions

Editor`s Note: The content of this clause is FFS.

### 11.3.3 When sharing MC gateway UE's IMS subscription

The MC clients, instantiated at the MC gateway UE on behalf of the non-3GPP devices which cannot host an MC client, rely on the IMS subscription provided by the MC gateway UE. In this case, the MC clients instantiated at the MC gateway UE share the credentials from the IMS subscription of the MC gateway UE, as shown in Figure 11.3.3-1.



Figure 11.3.3-1: Sharing MC gateway UE's IMC for non-3GPP devices which cannot host a client

\* \* \* \* Fourth change \* \* \* \*

## 11.4 Void

## 11.5 Procedures and information flows

### 11.5.1 Void















### 11.5.2 Void











### 11.5.3 Void































### 11.5.4 Void



















\* \* \* \* Fifth change \* \* \* \*

# A.7 Void



\* \* \* \* Sixth change \* \* \* \*

Annex D (informative):  
Considerations for MC gateway UE selection

# D.1 General

Operating conditions can influence the selection and the use of the MC gateway UE. Multiple conditions can be considered by the non-3GPP device either to connect to another MC gateway UE (e.g. with better operating conditions for the requested service), or to re-connect to the same MC gateway UE (e.g. reattempt connection after a certain time).

# D.2 Potential operating conditions

Possible operating conditions information could belong to one of the following categories:

**MC gateway UE capacity limits**

The MC gateway UE might not be able to allow non-3GPP devices to connect when the limit of connected MC clients has been reached.

**3GPP access congestion**

The MC gateway UE can make use of to the special Categories/Access Identity, the preferential access applies based on its assigned Access Control Class/Access Identity during periods of congestion. The MC gateway UE subscription allows to obtain priority treatment for the required communication.

Nevertheless, the serving access network can indicate to the UEs (including MC gateway UE) that Access Class Barring applies and this can be passed by the MC gateway UE to the non-3GPP device.

**PLMN reselection**

PLMN reselection depends on operator policy, roaming agreements, and on national/regional regulatory requirements.

**Network status information**

If the network status information of an EPS/5GS capability available at MC gateway UE, it can be further propagated to the corresponding non-3GPP devices for further processing (e.g., if the requested QoS for service can be provided for MC client or not).

\* \* \* \* Seventh change \* \* \* \*

# Annex E (informative):

# MC gateway UE routing capabilities

## E.1 General

The use of the MC gateway UE requires the support of an IP network behind the MC gateway UE, that a range of IP addresses are reachable over a single MC gateway UE. That enables the forwarding of signalling information and media plane between non-3GPP devices and MC server by the MC gateway UE.

## E.2 MC client IP address association

The use of a unique IP address by the MC clients shall be ensured for the period of association of the MC clients via the MC gateway UE with the IMS/SIP core and the MC server. Each MC gateway UE requires a unique IP address range for their MC client association which is known by the MC service environment and a correlation between the MC client's IP address and the MC gateway UE's IP address exists.



Figure E.2-1: MC client IP address relationship

Framed routing in accordance with IETF RFC 2865 [32], IETF RFC 3162 [33], 3GPP TS 23.501 [34] shall be used to enable the support of an IP network behind the MC gateway UE, such that a range of IP addresses is reachable over a single 3GPP transport session. It allows the routing of packets to IP addresses that do not belong to the PDN/PDU session of the MC gateway UE.

NOTE: The MC gateway UE can provide necessary IP address allocation to MC clients, e.g., as a DHCP relay agent in accordance with IETF RFC 1541 [35] and IETF RFC 8415 [36], or as a requesting router in accordance with IETF RFC 8415 [36] and 3GPP TS 23.401 [17] when using IPv6 prefix delegation.

## E.3 IP address association using the MC gateway UE

If the MC client relies on IP address provided by the MC gateway UE, the MC gateway UE shall store the correlation between the non-3GPP device and the IP address (MC gateway UE IP and the local IP) used by the MC client . The procedures initiated by the MC client, i.e., SIP registration, user authentication and service authorisation use the MC gateway UE's IP address.

The MC gateway UE assigns the local IPs from address pool which it maintains to the individual MC clients. Managing the local IP addresses, re-using the local IP address, and how the traffic is routed between the MC clients and the network is left for implementation.



Figure E.3-1: non-3GPP device uses MC gateway UE's IP address

\* \* \* \* End of change \* \* \* \*