**3GPP TSG-SA WG6 Meeting #39-e S6-201367**

**e-meeting, 31st August – 8th September 2020 (revision of S6-xxxxxx)**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **1** | **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:*** | Introduction of MC UE ID to allow mapping of location reports of a specific UE | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | BDBOS | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | enh3MCPTT | | | | |  | ***Date:*** | | | 2020-09-02 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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 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 MC system does not currently offer an identity for individual UE addressing. The requirement is expressed in clause 4.5.4 of 3GPP TS 22.179:  “... *An MCPTT User can simultaneously have several active MCPTT UEs, which, from an MCPTT Service point of view, are addressable individually and/or collectively within the context of their association to the MCPTT User*. …”  Location reports contain a MC service ID or Functional Alias. However, this is insufficient to allow MC service clients or servers consuming to map the location reports to the associated MC service UE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | These changes add a MC UE identity (MC UE ID) to allow mapping of location reports sent by different MC service UEs assigned to the same MC service ID. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Location reports sent from multiple MC service UEs assigned to the same MC service ID cannot be mapped properly. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 8.1.6 (NEW), 8.3.1, 10.1.1.1, 10.9.2.2, 10.9.2.7, 10.9.3.1, 10.9.3.6.1, A.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **N** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **N** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **N** | 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].

**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].

**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.

**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].

**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 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 UE ID:** A generic name for a routable unique identification of a specific MC service UE.

**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-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 [X] and 3GPP TS 23.032 [Y].

**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**

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

### 8.1.4 MC system identity (MC system ID)

The MC system ID is a globally unique identifier representing an MC system. The MC system ID shall be a URI.

8.1.5 Functional Alias

Functional alias provides a complementary, role-based user identification scheme which can be used by MC service users for operational purposes in the form of meaningful elements such as the function, the order number or vehicle identifications that can be used within any form of MC service communication. Functional alias takes a form of a URI. The application addressing remains in its form and forms the foundation for the association with the corresponding functional alias. An MC service user can simultaneously activate several functional aliases but only one can be associated to a certain communication.

Each functional alias is subject to the uniqueness principle within an organization and can be shared simultaneously by several MC service users, depending on the assignment. In this case, all assigned MC service users sharing a functional alias can be included in a communication.

An MC service user can simultaneously use different functional aliases from multiple service organizations to allow the MC service user to be reachable by different organizations.

The use of a functional alias always requires an association with the MC service ID. The MC service ID needs to be used to provide the security context for a communication.

### 8.1.6 MC UE identity (MC UE ID)

The MC UE identity is also known as the MC UE ID. The MC UE ID, which is unique to each MC service UE, allows identification of specific UEs. It may be used by location management server, location management clients or MC service servers to distinguish between location reports of different MC service UEs with the same MC service ID. The use of the MC UE ID always requires an association with a MC service ID.

The routable MC UE ID may include manufacturer related information (e.g. manufacturer name, brand, model, serial number, hardware version, software version).

NOTE: The MC UE ID may be provided during initial MC service UE configuration (by the responsible organisation). This provisioning may be done offline too, see clause A.6.

\* \* \* NEXT Change \* \* \* \*

## 8.3 Relationship between identities in different planes

### 8.3.1 Relationship between MC service ID, public user identity and MC UE ID

The following relationships exist between the MC service ID(s), the public user identity(ies) and the MC UE ID:

- An MC service ID may be mapped to one or more public user identities (e.g. multiple UEs, shared UE, multiple MC services);

- A public user identity may be mapped to one or more MC service IDs (e.g. UE-to-network relay);

- An MC service ID may be mapped to one or more public GRUUs (e.g. a user logging on from multiple UEs, multiple users sharing the same UE);

- A MC UE ID may be mapped to one public GRUU; and

- A MC UE ID may be mapped to one or more MC service IDs.

The MC service server manages the mapping between MC service IDs and public user identities.

The MC service server manages the mapping between MC service IDs and public GRUUs.

Temporary GRUUs are mapped to public GRUUs by the SIP core.

The public user identity does not necessarily identify the MC service user at the SIP signalling control plane. When the MC service provider and the home PLMN operator are part of the same trust domain, the public user identity in the SIP signalling control plane may also identify the MC service user at the application plane.

\* \* \* NEXT Change \* \* \* \*

## 10.1 MC service configuration

### 10.1.1 General

#### 10.1.1.1 MC service configuration on primary MC system

Depicted in figure 10.1.1.1-1 is a MC service configuration time sequence of the data related to specific MC service, representing the general lifecycle of MC service UE using an MC service.



Figure 10.1.1.1-1 MC service UE configuration time sequence and associated configuration data

The MC service UE is provided with initial UE configuration via a bootstrap procedure that provides the MC service UE's clients (e.g. MC service client, group management client, configuration management client, identity management client, key management client, functional alias management client) with critical information needed to connect to the MC system. This includes PDN connection information corresponding to the configured MC services on the MC service UE (see "EPS bearer considerations" in the 3GPP TS 23.379 [16]) , on-network server identity information for all application plane servers with which the MC service UE needs to interact and a unique MC UE ID that is used to distinguish between individual location messages sent by MC service UEs. See annex A.6 for more information.

The MC service UE is provided with UE configuration, MC service user profile configuration and group configuration via online configuration. While the MC service UE is using the MC service it may receive online configuration updates. If the MC service user profile configuration contains multiple MC service user profiles for an authenticated MC service user, then the MC service client and MC service server set the active MC service user profile to the configured pre-selected MC service user profile after MC service authorization (which can be updated by the MC service user using the procedure specified in subclause 10.1.4.6). The active MC service user profile can be changed by the MC service user to a different MC service user profile during MC service service (see MC service TSs).

The MC service is configured with the service configuration (not shown in the figure 10.1.1.1-1) which the MC service enforces during the entire phase of MC service UE using the MC service.

Editor's note: The extent of MC services available to an MC service UE with an unauthenticated MC user or unauthorized MC service user is described as 'limited services' in 3GPP TS 33.180 and is FFS.

Editor's note: The decision by the MC service UE to continue use of initial configuration data after MC service authorisation or discontinue its use in favour of configuration data obtained after MC service authorisation is FFS.

\* \* \* NEXT Change \* \* \* \*

#### 10.9.2.2 Location information report

Table 10.9.2.2-1 describes the information flow from the location management client to the location management server for the location information reporting.

Table 10.9.2.2-1: Location information report

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Set of MC service IDs | M | Set of identities of the reporting MC service user on the MC service UE (e.g. MCPTT ID, MCVideo ID, MCData ID) |
| Functional alias(es) (see NOTE 1) | O | Functional alias that corresponds to the MC service ID. |
| MC UE ID | O | MC UE ID of the reporting MC service UE at primary MC system. |
| Triggering event | M | Identity of the event that triggered the sending of the report |
| Location Information (see NOTE 2) | M | Location information of the individual MC service user |
| NOTE 1: Each functional alias corresponds to an individual MC service ID.  NOTE 2: This may contain multiple sets of elements for the MC service user. The following elements shall accompany the location information elements: time of measurement and optional accuracy. The following location information elements shall be optional (configurable) present: longitude, latitude, speed, bearing, altitude, ECGI, MBMS SAIs, with at least one provided. | | |

\* \* \* NEXT Change \* \* \* \*

#### 10.9.2.7 Location information notification

Table 10.9.2.7-1 describes the information flow from the location management server to the MC service server.

Table 10.9.2.7-1: Location information notification

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| MC service ID list | M | List of the MC service IDs (e.g. MCPTT ID, MCData ID, MCVideo ID) of the MC service users whose location information needs to be notified |
| MC service ID | M | Identity of the MC service user subscribed to location information of another MC service user (see NOTE 1) |
| MC UE ID list | O | List of MC UE IDs of the reporting MC service UEs at primary MC system. |
| Triggering event | M | Identity of the event that triggered the sending of the notification |
| Location Information (see NOTE 2) | M | Location information |
| NOTE 1: This is only used when the location management server sends location information notification to the MC service user who has subscribed the location information.  NOTE 2: This may contain multiple sets of elements for the MC service user. The following elements shall accompany the location information elements: time of measurement and optional accuracy. The following location information elements shall be optional (configurable) present: longitude, latitude, speed, bearing, altitude, ECGI, MBMS SAIs, with at least one provided. | | |

\* \* \* NEXT Change \* \* \* \*

### 10.9.3 Procedure

#### 10.9.3.1 Event-triggered location reporting procedure

NOTE 1: This procedure is valid for single MC system operation only.

The location management server provides location reporting configuration to the location management clients, indicating what information the location management server expects and what events will trigger the sending of this information to the location management server. The decision to report location information can be triggered at the location management client by different conditions. The conditions could include, for example, the reception of the location reporting configuration, initial registration, distance travelled, elapsed time, cell change, MBMS SAI change, MBMS session change, leaving a specific MBMS bearer service area, tracking area change, PLMN change, call initiation, or other types of events such as emergency alert, emergency call or imminent peril calls. The location report can include information described as time of measurement, accuracy, longitude, latitude, speed, bearing, altitude, ECGI, MBMS SAIs.



Figure 10.9.3.1-1: Event-triggered location reporting procedure

1. The location management server sends location reporting configuration message to the location management client(s) containing the initial configuration (or a subsequent update) for reporting the location of the MC service UE. This message can be sent over a unicast bearer to a specific location management client or as a group message over an MBMS bearer to update the location reporting configuration for multiple location management clients at the same time.

NOTE 2: The location reporting configuration information can be made part of the user profile, in which case the sending of the message is not necessary.

NOTE 3: Different location management clients may be given different location reporting criteria.

2. A location reporting event occurs, triggering step 3.

3. The location management client sends a location information report to the location management server, containing location information identified by the location management server and available to the location management client and optionally the MC UE ID.

4. Upon receiving the report, the location management server updates location of the reporting location management client. If the location management server does not have location information of the reporting location management client before, then just stores the reporting location information for that location management client.

\* \* \* NEXT Change \* \* \* \*

#### 10.9.3.6 Usage of location information procedure

##### 10.9.3.6.1 Event-trigger location information notification procedure

NOTE 1: This procedure is valid for single MC system operation only.

Figure 10.9.3.6.1-1 illustrates the high level procedure of event-trigger usage of location information. The same procedure can be applied for location management client and other entities that would like to subscribe to location information of MC service user.



Figure 10.9.3.6.1-1: Event-trigger usage of location information procedure

1. Based on the configurations, e.g., subscription, periodical location information timer, location management server is triggered to report the latest user location information to MC service server or location management client.

2. The location management server sends the location information report including the latest location information of one or more MC service users and optionally the MC UE IDs of one or more MC UEs to the MC service server or location management client. The latest location information is derived from the location report procedure as described in clause 10.9.3.1, or from PLMN operator (e.g. LCS network).

\* \* \* NEXT Change \* \* \* \*

# A.6 Initial MC service UE configuration data

The initial MC service UE configuration data is essential to the MC service UE to successfully connect to the MC system. The initial MC service UE configuration data can be the same or different across MC service UEs.

Data in table A.6-1 is provided to the MC service UE's clients (e.g. MC service client, group management client, configuration management client, identity management client, key management client) during the bootstrap process (see subclause 10.1.1), and can be configured on the MC service UE offline using the CSC-11 reference point or via other means e.g. as part of the MCPTT client's provisioning on the UE, using a device management procedure.

Table A.6-1: Initial MC service UE configuration data (on-network)

|  |  |
| --- | --- |
| Reference | Parameter description |
| Subclause 10.1.1 | PDN connectivity information |
|  | > HPLMN ID and optionally VPLMN ID to which the data pertains |
|  | > MC services PDN |
|  | >> APN |
|  | >> PDN access credentials |
|  | > MC common core services PDN |
|  | >> APN |
|  | >> PDN access credentials |
|  | > MC identity management service PDN |
|  | >> APN |
|  | >> PDN access credentials |
| Subclause 10.1.1 | Application plane server identity information |
|  | > Identity management server |
|  | >> Server URI |
|  | > Configuration management server |
|  | >> Server URI |
|  | > Key management server |
|  | >> Server URI (also known as KMSUri for security domain managed by KMS) |
|  | > Indication of whether the UE shall use IPv4 or IPv6 for on-network MCPTT |
|  | > MCPTT Server |
|  | >> Server URI |
|  | > Indication of whether the UE shall use IPv4 or IPv6 for on-network MCData |
|  | > MCData Server |
|  | >> Server URI |
|  | > Indication of whether the UE shall use IPv4 or IPv6 for on-network MCVideo |
|  | > MCVideo Server |
|  | >> Server URI |
|  | > Location management server |
|  | >> Server URI |
| Clause 10.1.1 | Operational information |
|  | > MC service UE information |
|  | >> MC UE ID |

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