**3GPP TSG-SA WG6 Meeting #64S6-245361**

**Orlando (FL), USA, 18th – 22nd November 2024 (revision of S6-245028)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.280** | **CR** | **0584** | **rev** | **3** | **Current version:** | **19.4.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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:*** | Updated functional architecture for recording and replay | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Airbus | | | | | | | | | |
| ***Source to TSG:*** | SA6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | enhMC | | | | |  | ***Date:*** | | | 2024-11-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The functional model approved in TS 23.280 CR567 (S6-243356) has some issues and missing parts. Furthermore, several new definitions are needed for the recording and replay service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Adding “Replay client” and a new “Recording admin client” to the main MC service UE functional model (fig 7.3.1.2-1). Moving “Replay UE” from the main functional model to a separate clause (7.3.1.3) and introducing a “Recording admin UE” in the same clause. Adding new refence point CSC-25 (GMS-CMS). Figure 7.3.1.2-3 clean-up. Adding/modifying the definitions (3.1) and abbreviations (3.3). | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Fundamental concepts remain unclear and essential elements and reference points will be missing from the MC functional models | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 3.3, 7.3.1, 7.3.1.1 (new), 7.3.1.2 (new), 7.3.1.3 (new), 7.4.2.4.1, 7.4.2.4.2, 7.4.2.4.4 (new), 7.5.2.2, 7.5.2.25a (new), 7.5.2.30, 7.5.2.31, 7.5.2.32, 7.5.2.33, 7.5.2.35, 8.1.1, 8.1.2.a (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:*** | | 1) Figure 7.3.1.2-1 has faced an editorial clean-up (all texts inside boxes have been attached to the box and centered etc) so the figure should be copied to the new TS version as a whole. Same applies for fig 7.3.1.2-3.  2) A.Y, that is referenced in this CR, is defined in CR586. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* \* First change \* \* \* \*

## 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, 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 and recording admin and replay 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.

**Recording admin UE**: A UE that can be used to configure targets for recording. Recording admin UE can be a mobile device or a (computer) workstation.

**Recording admin and replay user profile:** A set of parameters defining the authorizations for a recording administrator and/or replay user.

**Recording administrator:** A user, identified by MCRec ID, who, after authorization, is able to set and modify target users and target groups for recording.

**Recording admin client:** A client application that a recording administrator can use to set target users and target groups for recording.

**Recording server:** A server that is able to log the metadata and record the media of MCPTT, MCData, and MCVideo group communications and private communications. This server is also able to retrieve the logged/recorded data when requested by an authorized replay user.

**Replay user:** A user, identified by an MCRec ID, who, after authorization, is able to fetch and replay recorded MCPTT, MCData, and MCVideo metadata and media of MC service group communications and MC service private communications under the user’s authority.

**Replay UE**: A user equipment that can be used to fetch and replay recorded MCPTT, MCData, and MCVideo metadata and media of MC service group communications and MC service private communications under the UE user’s authority. The Replay UE can be a mobile device or a (computer) workstation.

**Replay client:** A client application that an authorized replay user can use to fetch and replay recorded metadata and media from a recording server.

**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 UE with functionality that enables access to the MC service for non-3GPP devices.

**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 \* \* \* \*

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

APN Access Point Name

BM-SC Broadcast Multicast Service Centre

CMS Configuration Management Server

CSC Common Services Core

CSCF Call Server Control Function

DPF Direct Provisioning Function

E-UTRAN Evolved Universal Terrestrial Radio Access Network

EPC Evolved Packet Core

EPS Evolved Packet System

FEC Forward Error Correction

GBR Guaranteed Bit Rate

GCS AS Group Communication Service Application Server

GCSE\_LTE Group Communication Service Enabler over LTE

GMS Group Management Server

GRUU Globally Routable User agent URI

HSS Home Subscriber Server

HTTP Hyper Text Transfer Protocol

I-CSCF Interrogating CSCF

IARI IMS Application Reference Identifier

ICE Interactive Connectivity Establishment

ICSI IMS Communication Service Identifier

IdMS Identity Management Server

IM CN IP Multimedia Core Network

IMPI IP Multimedia Private Identity

IMPU IP Multimedia PUblic identity

IMS IP Multimedia Subsystem

KMS Key Management Server

LCS Location Services

LMC Location Management Client

LMS Location Management Server

MBMS Multimedia Broadcast and Multicast Service

MBSFN Multimedia Broadcast multicast service Single Frequency Network

MC Mission Critical

MC ID Mission Critical user identity

MCPTT AS MCPTT Application Server

MCPTT ID MCPTT user identity

MCRec ID Recording admin and replay user identity

NAT Network Address Translation

P-CSCF Proxy CSCF

PLMN Public Land Mobile Network

ProSe Proximity-based Services

PSI Public Service Identity

QoS Quality of Service

RAN Radio Access Network

RF Radio Frequency

ROHC RObust Header Compression

S-CSCF Serving CSCF

SIP Session Initiated Protocol

SSL Secure Sockets Layer

TLS Transport Layer Security

TMGI Temporary Mobile Group Identity

UDC User Data Convergence

UDR User Data Repository

USB Universal Serial Bus

URI Uniform Resource Identifier

WLAN Wireless Local Area Network

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

**MCData**

**MCPTT**

**MCVideo**

\* \* \* \* 3rd change \* \* \* \*

### 7.3.1 On-network functional model

#### 7.3.1.1 General

Each MC service can be represented by an application plane functional model. The functional model across MC services may be similar but is described by the individual functional entities and reference points that belong to that MC service. Within the application plane for an MC service there is a common set of functions and reference points. The common set is shared across services. This common set of functions and reference points is known as the common services core.

#### 7.3.1.2 Functional model for an MC system

Figure 7.3.1.2-1 shows the functional model for the application plane for an MC system.



Figure 7.3.1.2-1: Functional model for application plane for an MC system

The common services core functions and reference points shown in figure 7.3.1.2-1 are shared across each MC service. The description of the functions and reference points specific to an MC service is contained in the corresponding MC service TS.

NOTE 1: The ACM client and ACM server are not essential entities to enable MC services. The ACM client and ACM server are optional and only required if the administrative configuration management feature is deployed. In administrative configuration management case, only the UE of an authorized MC service user requires such an ACM client.

NOTE 2: The recording server, recording admin client and replay client are optional entities. They are not essential to enable MC services. The recording admin client and replay client can also be implemented in devices that do not contain MCPTT / MCData / MCVideo service clients and that are connected to the CSC and recording server using other communication networks than EPS. See subclause 7.3.1.3.

In the model shown in figure 7.3.1.2-1, the following apply:

- A specific MC service server is an instantiation of a GCS AS in accordance with 3GPP TS 23.468 [18].

- The functional alias management client is an integrated functional entity of the configuration management client. The functional alias management client is described in subclause 7.4.2.2.12.

- The functional alias management server is an integrated functional entity of the configuration management server. The functional alias management server is described in subclause 7.4.2.2.13.

Figure 7.3.1.2-2 shows the functional model for the signalling control plane.



Figure 7.3.1.2-2: Functional model for signalling control plane

Figure 7.3.1.2-3 shows the relationships between the reference points of the application plane of an MC service server and the signalling plane.





Figure 7.3.1.2-3: Relationships between reference points of MC service application plane and signalling control planes

NOTE 3: Application plane reference point CSC-7 makes use of SIP-2 reference point when the group management servers are connected by a single SIP core. Where they are joined by more than one SIP core, CSC-7 also makes use of the SIP-3 reference point.

NOTE 4: For simplicity, the HTTP proxy, which provides the interconnection between HTTP-1, HTTP-2 and HTTP-3 reference points, is not shown in figure 7.3.1.2-3.

NOTE 5: CSC-5, CSC-15, REC-3 and REC-4 make use of SIP-1 and SIP-2 reference points. For simplicity, this mapping relationship is not shown in figure 7.3.1.2-3.

#### 7.3.1.3 Functional model for Recording admin UE and Replay UE

The recording admin and replay functions can be implemented also in UEs that are not MC service UE’s i.e. do not have the MCPTT / MCData / MCVideo clients.

A minimum set of MC common functions are required in such UEs. Two examples are presented in this clause, a “Recording admin UE” and a “Replay UE”.



Figure 7.3.1.3-1: Functional model for application plane of a Recording admin UE



Figure 7.3.1.3-2: Functional model for application plane of a Replay UE

NOTE: A recording admin client and a replay client can also be implemented in the same UE.

\* \* \* \* 4th change \* \* \* \*

##### 7.4.2.4.1 Replay client

The replay client is a functional entity that can be used by an authorized replay service user to retrieve recorded metadata and media from recording server(s) and replay it. The replay client shall not perform recording admin services.

##### 7.4.2.4.2 Recording server

The recording server is a functional entity that can receive and record communications metadata and media, relating to target users and target groups, from MC service servers. The recording server securely stores the recorded information into mass storage(s) and allows controlled access for replay/retrieve functions.

The security aspects of storing metadata and media into mass storage are specified in TS 33.180 [25].

The recording server functional entity is supported by the SIP AS functional entities of the signalling control plane.

The target users and/or groups for recording are set in the MC service user profile configuration data (A.3) and in the group configuration data (A.4). This can be done by an authorized recording admin user utilizing the CSC-4 reference point (user profiles) and CSC-2 reference point (group profiles).

\* \* \* \* 5th change \* \* \* \*

##### 7.4.2.4.4 Recording admin client

The recording admin client is a functional entity that represents a recording administrator (who is identified with an MC ID) for user authentication and service authorization as well as when setting or modifying target users and target groups for recording via configuration management client and group management client. The recording admin client shall not perform replay service.

\* \* \* \* 6th change \* \* \* \*

#### 7.5.2.2 Reference point CSC-1 (between the identity management client and the identity management server)

The CSC-1 reference point, which exists between the identity management client and the identity management server, provides for the authentication of the common services core to the MC service client, recording admin client and replay client and subsequent authentication of the user to the common services core on behalf of applications within the application plane.

CSC-1 is specified in 3GPP TS 33.180 [25].

\* \* \* \* 7th change \* \* \* \*

#### 7.5.2.25a Reference point CSC-25 (between the group management server and the configuration management server)

The CSC-25 reference point, which exists between the group management server and the configuration management server, to allow the group management server to obtain non-group configuration related information (e.g. recording admin user profiles). The CSC-25 reference point shall use HTTP-1 reference point and HTTP-2 reference point for transport and routing of non-subscription/notification related signalling. The CSC-25 reference point shall use SIP-2 reference point for transport and routing of subscription/notification related signalling.

\* \* \* \* 8th change \* \* \* \*

#### 7.5.2.30 void

#### 7.5.2.31 Reference point REC-2 (between recording server and key management server)

The REC-2 reference point, which exists between recording server and key management server, provides a means for the key management server to provide security related information (e.g. encryption keys) to the MC recording server.

The REC-2 reference point shall use the HTTP-1 and HTTP-2 reference points for transport and routing of security related information to the recording server.

Editor's note: REC-2 shall be specified in 3GPP TS 33.180 [25]. Whether existing CSC-8 or CSC-9 can be used as REC-3 is FFS and in SA3's scope.

#### 7.5.2.32 Reference point REC-3 (between recording server and configuration management server)

The REC-3 reference point, which exists between recording server and configuration management server, is used by the recording server to obtain user profiles (and updated user profile data) of the replay service users.

The REC-4 reference point shall use HTTP-1 and HTTP-2 reference points for transport and routing of non-subscription/notification related signalling. The REC-4 reference point shall use SIP-2 and SIP-3 reference point for transport and routing of subscription/notification related signalling. The SIP-3 reference point is used when the recording server and the configuration management server are served by different SIP cores.

#### 7.5.2.33 void

\* \* \* \* 9th change \* \* \* \*

#### 7.5.2.35 void

\* \* \* \* 10th change \* \* \* \*

### 8.1.1 Mission Critical user identity (MC ID)

The mission critical user identity is also known as the MC ID. The MC ID is the identity that an MC service user or recording admin service user or replay service user presents to the identity management server during a user authentication transaction. In general, since identity management is a common service, it uses an identity which is linked to a set of credentials (e.g. biometrics, secureID, username/password) that may not necessarily be tied to a single mission critical service. The MC ID and the MC service ID or MCRec ID may be the same. The MC ID uniquely identifies the MC service user or recording admin and/or replay service user to the identity management server. The MC ID is used by the identity management server to provide the identity management client a means for mission critical service authentication.

NOTE: The specific security and authentication mechanisms required in order to use the MC user identity is specified in 3GPP TS 33.180 [25].

\* \* \* \* 11th change \* \* \* \*

### 8.1.2a Recording admin and replay service user identity (MCRec ID)

The recording admin and replay service user identity (MCRec ID) is a globally unique identifier that identifies the recording administrator and/or replay service user in an MC system.

The MCRec ID shall be a URI. The MCRec ID indicates the MC system where that ID is defined.

The authorizations to modify other users’ or groups’ configuration tables (recording admin users) as well as the authorizations to replay recordings (replay users) are set in the Recording admin and/or replay user profile configuration data (on-network) (A.Y).

For the access to related servers (CMS, GMS, Recording server), the recording admin and replay services utilizes the same service authorization framework as MC services. The service authorization framework is defined in TS 33.180 [25].

\* \* \* \* End of changes \* \* \* \*