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Mission Critical Data (MCData);
Stage 2
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Foreword

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1 Scope

This document specifies the functional architecture, procedures and information flows needed to support the Mission Critical Data (MCData) services. MCData is a suite of services which utilizes the common functional architecture defined in 3GPP TS 23.280 [5] to support MC services over LTE including the common services core.

MCData services suite consists of the following sub-services:

- short data service (SDS);
- file distribution (FD).

MCData features include:

- conversation management;
- transmission and reception control;
- communication release; and
- enhanced status.

The corresponding service requirements are defined in 3GPP TS 22.282 [3] and 3GPP TS 22.280 [2].

The present document is applicable primarily to MCData service using E-UTRAN access based on the EPC architecture defined in 3GPP TS 23.401 [4]. Certain application functions of the MCData service could also be supported via non-3GPP access networks but no additional functionality is specified to support non-3GPP access.

The MCData service can be used for public safety applications and also for general commercial applications e.g. utility companies and railways.

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 22.280: "Mission Critical Common Requirements (MCCoRe); Stage 1".
- [3] 3GPP TS 22.282: "Mission Critical Data services over LTE".
- [4] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
- [5] 3GPP TS 23.280: "Common functional architecture and information flows to support mission critical communication services; Stage 2".
- [6] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".
- [7] 3GPP TS 23.303: "Proximity-based services (ProSe); Stage 2".
- [8] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE_LTE); Stage 2".
- [9] 3GPP TS 23.237: "IP Multimedia Subsystem (IMS) Service Continuity; Stage 2".

- [10] 3GPP TS 23.002: "Network Architecture".
- [11] 3GPP TS 23.379: "Functional architecture and information flows to support Mission Critical Push To Talk (MCPTT); stage 2".
- [12] 3GPP TS 29.283: "Diameter data management applications".
- [13] 3GPP TS 33.180: "Security of the Mission Critical Service".
- [14] 3GPP TS 23.203: "Policy and charging control architecture".
- [15] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".
- [16] 3GPP TS 29.468: "Group Communication System Enablers for LTE (GCSE_LTE); MB2 reference point; Stage 3".

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].

Auto-send: A mechanism where data from sending MCDData user(s) is automatically transmitted to the MCDData server i.e. without requesting permission to transmit.

Auto-receive: A mechanism where data is automatically delivered to the receiving MCDData user(s) from the MCDData server i.e. without requiring acceptance for delivery.

Conversation identifier: A universally unique identifier that identifies a series of related MCDData transactions.

Data stream: A sequence of data that is agnostic to any underlying media (e.g. audio, video, telemetry data), on which processing of data (e.g. semantic, syntactic, save or filter operation) can begin before all the content is received.

FD disposition: is one of "not downloaded" and "download completed".

MCDData client: An instance of an MC service client that provides the client application function for the MCDData service.

MCDData group: An MC service group configured for MCDData service.

MCDData group affiliation: An MC service group affiliation for MCDData.

MCDData group communication: A one-to-many communication using an MCDData service.

MCDData group de-affiliation: An MC service group de-affiliation for MCDData.

MCDData ID: An instance of an MC service ID within the MCDData service.

MCDData server: An instance of an MC service server that provides the server application function for the MCDData service.

MCDData service: A data communication service comprising at least one underlying generic capability (e.g. SDS, file distribution, data streaming) with strong security, high availability, reliability and priority handling to support applications for mission critical organizations and mission critical applications for other businesses and organizations (e.g. utilities, railways).

MCDData UE: An MC service UE that can be used to participate in MCDData services.

MCDData user: An MC service user who is authorized for MCDData services suite via an MCDData UE.

Reception control: A mechanism that allows the MCDData service to regulate data reception to the receiving MCDData users, prior to the delivery of data to the MCDData UE.

Reply identifier: A reference to the original MCDData transaction to which the current transaction is a reply.

SDS data: A payload with limited size and variable content type used in SDS transactions.

SDS disposition: is one of "undelivered", "delivered" and "read".

Standalone communication: A unidirectional one-to-one or group data communication completed after one transaction.

Transaction identifier: A unique identifier that identifies a MCDData transaction within a conversation.

Transmission control: A mechanism that allows the MCDData service to regulate data transmission requests from the sending MCDData users, either prior to or after active sending from the MCDData UE.

For the purposes of the present document, the following terms and definitions given in 3GPP TS 22.280 [2] apply:

Mission Critical
Mission Critical Applications
Mission Critical Service
Mission Critical Organization

For the purposes of the present document, the following terms and definitions given in 3GPP TS 22.282 [3] apply:

MCDData system

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.280 [5] apply:

MC service client
MC service group
MC service group affiliation
MC service group de-affiliation
MC service ID
MC service server

3.2 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].

DS	Data Streaming
FD	File Distribution
MC	Mission Critical
MCDData ID	MCDData user identity
SDS	Short Data Service

4 Introduction

The MCDData service suite provides a set of generic capabilities and specific services to enable one-to-one and group data communications between MCDData users.

The MCDData architecture utilises the common functional architecture to support mission critical services over LTE defined in 3GPP TS 23.280 [5] and aspects of the IMS architecture defined in 3GPP TS 23.228 [6], the Proximity-based Services (ProSe) architecture defined in 3GPP TS 23.303 [7], the Group Communication System Enablers for LTE (GCSE_LTE) architecture defined in 3GPP TS 23.468 [8], the Security of the Mission Critical Service in 3GPP TS 33.180 [13] and the PS-PS access transfer procedures defined in 3GPP TS 23.237 [9] to enable support of the MCDData service.

The MCDData UE primarily obtains access to the MCDData service via E-UTRAN, using the EPS architecture defined in 3GPP TS 23.401 [4]. Certain application functions of MCDData service can be accessed using MCDData UEs via non-3GPP access networks.

5 Architectural requirements

5.1 Transmission control

The MCDData service shall support the ability to transmit small amounts of data automatically (i.e. auto-send) to the selected recipient user (private communication) or affiliated members of the selected MCDData group. The data size for auto-send shall be configured by the MCDData administrator.

When the data size exceeds the maximum data size for automatic transmission, the MCDData service shall invoke a transmission request grant approach before data is permitted to be transmitted. The MCDData service shall provide a configurable limit for the maximum amount of data or time that an MCDData user can transmit in a single request, which may be configured by the MCDData administrator.

Editor's Note: Additional criteria such as frequency of transmission, category/type of data, etc., for transmission control arbitration is FFS.

For congestion control, related to transmission requests, the MCDData service may perform the following:

- reject the data transmission requests that exceed the automatic transmission size and then shall notify the MCDData user of the rejection;
- queue the data transmission requests; or
- at anytime, withhold the permission to transmit data automatically.

The MCDData service shall notify the transmitting MCDData group member if there are no other MCDData group members affiliated to the MCDData group.

5.2 Reception control

The MCDData service shall support the ability to receive small amounts of data automatically (i.e. auto-receive). The data size for auto-receive shall be configured by the MCDData administrator.

When the data size exceeds the maximum data size for automatic reception, the MCDData service shall store the data in a temporary store, and notify the receiving MCDData users. The data which is temporarily stored may be configured with "time to live" value, and subsequently, the data may be purged from the temporary store upon expiration of "time to live".

The recipient individual user (private communication) or affiliated members of the MCDData group(s) shall be notified of the list of available data either on request or periodically.

The MCDData service shall provide a mechanism for the MCDData user to select the data to be downloaded from the list corresponding to the temporary store, subject to limitations such as expiration time and size.

5.3 Short Data Service capability

The MCDData service shall support SDS capability for one-to-one and group communications.

The SDS capability shall support messages with a maximum payload of at least 1000 bytes. The supported message types shall include text, binary, or hyperlinks. Multiple message types may be interleaved within in a single message payload. The payload shall support indication of location information of the sending MCDData user.

The MCDData service shall support messages to be sent over the signalling plane or the media plane.

The SDS capability shall allow for multiple related messages to be correlated and sequenced within the MCDData service.