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TECHNICAL SPECIFICATION

LTE;
Functional architecture and information flows to support Mission Critical Video (MCVideo);
Stage 2
(3GPP TS 23.281 version 16.4.0 Release 16)

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1 Scope

This document specifies the functional model, procedures and information flows needed for the mission critical video (MCVideo) service. Support for both MCVideo group streaming and MCVideo private streaming operating in on-network and off-network modes of operation is specified.

The corresponding service requirements are defined in 3GPP TS 22.280 [2], and 3GPP TS 22.281 [3].

The present document is applicable primarily to mission critical video service using E-UTRAN access based on the common functional architecture for mission critical services defined in 3GPP TS 23.280 [6] and the EPC architecture defined in 3GPP TS 23.401 [8].

The MCVideo 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*.

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[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 22.280: "Mission Critical Common Requirements (MCCoRe); Stage 1".

[3] 3GPP TS 22.281: "Mission Critical Video services".

[4] 3GPP TS 23.002: "Network Architecture".

[5] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[6] 3GPP TS 23.280: "Common functional architecture to support mission critical services; Stage 2".

[7] 3GPP TS 23.303: "Proximity-based services (ProSe); Stage 2".

[8] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[9] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE_LTE); Stage 2".

[10] Void

[11] 3GPP TS 23.203: "Policy and charging control architecture".

[12] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[13] 3GPP TS 29.468: "Group Communication System Enablers for LTE (GCSE_LTE); MB2 reference point; Stage 3".

[14] 3GPP TS 33.180: "Security of the mission critical service".

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].

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

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

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

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

MCVideo group home system: The mission critical system where the MCVideo group is defined.

MCVideo group host server: The MCVideo server within a mission critical system which provides centralised support for MCVideo services of an MCVideo group defined in a MCVideo group home system.

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

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

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MCVideo service: A video communication service supporting applications for mission critical organizations and mission critical applications for other businesses and organizations (e.g., utilities, railways) with strong security, high availability, reliability and priority handling.

MCVideo system: The collection of applications, services, and enabling capabilities required to provide Mission Critical video for a Mission Critical Organization.

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

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

Transmission control: Video transmitting control mechanism in an MCVideo service that determines which participants have the authority to transmit video, and determines the onward downlink video transmission during an video call.

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
Mission Critical System

For the purposes of the present document, the following terms and definitions given in 3GPP TS 22.281 [3] apply:

Real Time
Real Time Video

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.280 [6] apply:

MC service client
MC service group
MC service group affiliation
MC service group de-affiliation
MC service group home system

MC service group host
MC service ID
MC service server

3.2 Symbols

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

Nc2

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].

E-UTRAN	Evolved Universal Terrestrial Radio Access Network
EPC	Evolved Packet Core
GCS AS	Group Communication Service Application Server
GCSE_LTE	Group Communication Service Enabler over LTE
HTTP	Hyper Text Transfer Protocol
IMS	IP Multimedia Subsystem
MC	Mission Critical
MCVideo	Mission Critical Video
MCVideo group ID	MCVideo group identity
MCVideo ID	MCVideo user identity
ProSe	Proximity-based Services
SIP	Session Initiated Protocol

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4 Introduction

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The MCVideo service supports video media communication between several users (i.e. group call), where each user has the ability to gain access to the permission to stream video in an arbitrated manner. The MCVideo service also supports private calls between two users.

The MCVideo architecture is based on the functional architecture for mission critical communication services defined in 3GPP TS 23.280 [6].

5 Architectural requirements

5.1 Media routing requirements

The video media flow for a private call shall be routed according to one of the following two options:

a) Option 1:

   1) Through the primary MCVideo system if both users in the call belong to the same organisation; or

   2) Through the primary MCVideo system of each users, if the users in the call do not belong to the same organisation.

b) Option 2: The video media flow may be routed locally, under the control of the primary MCVideo system, through an entity allowing the duplication of the media flow to the primary MCVideo system of each user.

The video media flow for a group call shall be routed to the group home MCVideo system.

5.2 MCVideo group affiliation and MCVideo group de-affiliation

MCVideo group affiliation shall be as specified in clause 5.2.5 of 3GPP TS 23.280 [6]. In addition, the following requirements shall be fulfilled by the MCVideo service for MCVideo users affiliated to MCVideo groups:

- MCVideo users receive notifications for MCVideo group call setup and invitations for their affiliated MCVideo group(s).
- MCVideo users select an affiliated MCVideo group to initiate a new group MCVideo call or transmit media in an existing MCVideo group call.
- MCVideo users receive media and events from their affiliated MCVideo group(s).

5.3 Device inventory requirements

The MCVideo service shall provide device inventory capabilities for MCVideo UEs. The device inventory capabilities shall include:

- device information registration;
- device information storage; and
- device information query.

5.4 Device discovery requirements (off-network)

The MCVideo service shall provide device discovery for devices as requested by the MCVideo user according to the MC service provider policy for off-network operations.

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5.5 Bearer management

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5.5.1 General

The MCVideo UE shall use the APNs as defined in subclause 5.2.7.0 of 3GPP TS 23.280 [6]. The MCVideo UE shall use the MC services APN as defined in subclause 5.2.7.0 of 3GPP TS 23.280 [6] for the SIP-1 reference point.

5.5.2 EPS bearer considerations

The EPS bearer considerations specified in subclause 5.2.7.2 of 3GPP TS 23.280 [6] shall apply.

5.5.3 EPS unicast bearer considerations for MCVideo

For an MCVideo call session request, resources shall be requested utilising interaction with dynamic PCC. The MCVideo system shall request resources over Rx to a PCRF. It is recommended that the dedicated bearer(s) for video media and control of the video media (i.e. MCVideo-4 and MCVideo-7) utilise the QCI values depending on the MCVideo mode of the MCVideo call/session, as per table 5.5.3-1. For transmission and reception control signalling, the QCI value of 69 is recommended as specified in 3GPP TS 23.203 [11]. The request of resources over Rx shall include an application identifier for MCVideo in order for the PCRF to evaluate the correct QCI.

Table 5.5.3-1: QCI values to use for EPS unicast bearers for each MCVideo mode

MCVideo mode	QCI value utilised (as specified in 3GPP TS 23.203 [11])
Urgent real-time mode	67
Non-urgent real-time mode	67
Non real-time mode	4