**3GPP TSG-SA WG6 Meeting #60** **S6-243367r1**

**Maastricht, The Netherlands, 19-23 August 2024 (revision of S6-243283)**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.289** | **CR** | **0127** | **rev** | **1** | **Current version:** | **19.3.0** |  |
|  | | | | | | | | |
| *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:*** | Enhancement to MCVideo with 5G network capabilities | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Hisilicon, China BroadNet | | | | | | | | | |
| ***Source to TSG:*** | SA6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | enhMC | | | | |  | ***Date:*** | | | 2024-08-09 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In Rel-18, several network capabilities are introduced to enhance the XR service as specified in clause 5.37 of 3GPP TS 23.501.  Those capabilities also benefit the MCVideo service to improve the user experience in wirelesss scenario. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introduce a new clause to define the procedure of enhancing the MCVideo with the 5G network capabilities: L4S marking and QoS monitoring. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The MCVideo cannot benefit from the new 5G network capabilities to improve the user experience. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, New {7.x, 7.x.1, 7.x.2, 7.x.2.1, 7.x.3, 7.x.3.1} | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 Changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

# 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 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

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

[4] 3GPP TS 23.281: "Functional architecture and information flows to support Mission Critical Video (MCVideo); Stage 2".

[5] 3GPP TS 23.282: "Functional architecture and information flows to support Mission Critical Data (MCData); Stage 2".

[6] 3GPP TS 23.379: "Functional architecture and information flows to support Mission Critical Push To Talk (MCPTT); Stage 2".

[7] 3GPP TS 23.501: "System architecture for the 5G System (5GS)".

[8] 3GPP TS 23.002: "Network Architecture".

[9] 3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System (5GS); Stage 2".

[10] 3GPP TS 23.502: "Procedures for the 5G System (5GS)".

[11] 3GPP TS 22.179: "Mission Critical Push to Talk (MCPTT); Stage 1".

[12] 3GPP TS 22.280: "Mission Critical Services Common Requirements (MCCoRe); Stage 1".

[13] 3GPP TS 22.281: "Mission Critical (MC) Video".

[14] 3GPP TS 22.282: "Mission Critical (MC) Data".

[15] 3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[16] 3GPP TS 23.468: "Group Communication System Enablers for LTE (GCSE\_LTE); Stage 2".

[17] 3GPP TS 23.304: "Proximity based Service (ProSe) in the 5G System (5GS); Stage 2".

[18] 3GPP TS 23.237: "IP Multimedia Subsystem (IMS) Service Continuity; Stage 2".

[19] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

[20] 3GPP TS 23.479: "UE MBMS APIs for Mission Critical Services".

[21] 3GPP TS 26.502: "5G Multicast-Broadcast User Service Architecture".

[22] 3GPP TS 22.289: "Mobile communication system for railways".

[23] 3GPP TS 23.283: "Mission Critical Communication Interworking with Land Mobile Radio Systems".

[RFC9330] IETF RFC 9330:"Low Latency, Low Loss, Scalable Throughput (L4S) Internet Service: Architecture".

[RFC6679] IETF RFC 6679:" Explicit Congestion Notification (ECN) for RTP over UDP".

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* First Changes \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

## 7.x MCVideo enhancement with L4S ECN marking

### 7.x.1 General

These clauses specify the procedure for the MCVideo communication (e.g., video pull from server) enhancement with 5GS functionalities defined in clause 5.37 of 3GPP TS 23.501 [7]. With the procedure and information flows defined in this clause, the MCVideo server requests the L4S ECN marking and obtain the DL congestion information via the L4S ECN feedback from MC client as as described in IETF RFC 9330 [RFC9330] and IETF RFC 6679 [RFC6679], and adjusts the DL media packet transmission control based on the feedback, e.g., the MCVideo media packet sending rate.

The MCVideo client is capable of supporting the L4S handling capability including e.g., parsing the L4S ECN mark in the IP header, reporting the L4S feedback to the MCVideo server. The MCVideo clients report their L4S handling capabilities to the MCVideo server. The MCVideo server determines to initiate the request for L4S marking towards the network based on the MCVideo clients’ L4S handling capabilities.

### 7.x.2 Information flows

#### 7.x.2.1 L4S ECN feedback report

Table 7.x.2.1-1 defines the L4S ECN feedback report from MCVideo client to MCVideo server to provide DL L4S ECN feedback information.

Table 7.x.2.1-1: L4S ECN feedback report

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| MCVideo ID | M | Identity of the MCVideo user |
| Media identifier | O | Identifies the communication, e.g. by identifying the media flow within a media multiplex, present only if media multiplexing |
| L4S ECN information | M | The L4S ECN information reported |

### 7.x.3 Procedures

#### 7.x.3.1 One-from-server video pull enhancement with 5GS capabilities

Procedure in figure x.3.1-1 is the common signalling control plane procedures for the MCVideo communication enhancement with 5GS capabilities.

Pre-conditions:

1. The MCVideo server already obtains the L4S handling capability from the MCVideo client 1~n.

Editor’s NOTE: Whether to reuse the registration procedure or a new procedure to indicate the L4S handling capability to the MCVideo server is FFS.

1. The MCVideo client 1~n are in a ongoing MCVideo communication.

MCVideo

server

5GS

MCVideo client 1/UE1

1. MCVideo pull from server request

4. Media plane and transmission control established

2. Authorization check

6b. ECN marking for L4S in the 5GS

3. MCVideo pull from server response

5. Video stream from MCVideo server

6a. Request for L4S marking

6c. L4S feedback report

7. DL stream control, e.g., adjust packet sending rate

Figure x.3.1-1: one-from-server video pull enhancement with L4S ECN marking

1-5. Same as step 1 to step 5 in clause 7.3.2.4.2 of 3GPP TS 23.281 [4].

6a. The MCVideo server may determine to utilize the 5GS L4S capabilities to obtain the network connectivity status, e.g., congestion to improve the downlink stream transmission control. The MCVideo server interacts with the 5GS to request the ECN marking for L4S as specified in 3GPP TS 23.502 [10].

6b. The 5GS starts to performs the ECN marking as specified in 3GPP TS 23.501 [7]. The MCVideo UE receives the DL media stream with ECN marking in the IP header which reflects the DL network congestion status.

6c. The MCVideo client, based on the DL ECN marking in the IP header, generates and sends the L4S ECN feedback report towards the MCVideo server as described in IETF RFC 9330 [RFC9330] and IETF RFC 6679 [RFC6679].

7. The MCVideo server, based on step 6b performs the DL media stream control, e.g., adjust the DL media packet sending rate.

NOTE: How the DL media packet sending rate is adapted is outside the scope of the present document.