**3GPP TSG-SA WG6 Meeting #47-e S6-220xxx**

**e-meeting, 14th – 22nd February 2022 (revision of S6-220234)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **TS23.289** | **CR** | **0041** | **rev** | **1** | **Current version:** | **18.0.0** |  |
|  | | | | | | | | |
| *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:*** | Usage of FEC capabilities | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, Hisilicon | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | MCOver5MBS | | | | |  | ***Date:*** | | | 2022-02-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **C** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | FEC is one of important mechanism for meeting required level of QoS when using broadcast transmission for MCX.  In 4G system, supporting of FEC is optional. When required, it can be either performed by MCX service server, or BM-SC upon indication in MB-2 signalling.  In 5G MBS system, it has been agreed by SA4 that FEC can be supported by MBSTF.  So it is proposed to support similar mechanism in MCX over 5G. | | | | | | | | |
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| ***Summary of change:*** | | Adding related description of supporting FEC in MCXover5G. | | | | | | | | |
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| ***Consequences if not approved:*** | | FEC mechanism for meeting required level of QoS when 5G MBS (especially 5G broadcast) is used for MCX service transmission will not be available. | | | | | | | | |
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| ***Clauses affected:*** | | 7.3.3.x (new), 7.3.3.x.1 (new), 7.3.3.x.2 (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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

#### 7.3.3.X Use of FEC to protect 5G MBS transmissions

##### 7.3.3.x.1 General

Application layer FEC can be used to recover the packet losses when delivering a MC service over 5G MBS, to reach its required level of QoS.

The support of FEC is optional for the MC service servers and MC service clients. FEC can be applied by the MBSTF, if required by the MC service server (as specified in clause 7.3.3.x.2), or directly by the MC service server (as defined in 3GPP TS 23.280 [3]).

##### 7.3.3.x.2 FEC encoding by the MBSTF

In this procedure, depicted in figure 7.3.3.x.2-1, the MC service server asks the MBSF/MBSTF to apply FEC to a set of media, transported by a 5G MBS session, using the Setup FEC request.

This procedure can be applied when using pre-created MBS session and service announcement (as specified in clause 7.3.3.1.2) or using MBS session and service announcement (as specified in clause 7.3.3.1.3).

Pre-condition:

1. The MC service server has already configured and activated a 5G MBS session.



Figure 7.3.3.x.2-1: Application of FEC by the MBSF-MBSTF

1. The MC service server decides to set up FEC for a set of MC service media flows. It will send the FEC request to MBSF/MBSTF.

It includes the following elements: the TMGI of the MBS session transporting those media, the media descriptions (codecs, transport protocols, bitrates, destination ip addresses and ports), the identification of the FEC repair packet flow (IP destination and port), and an upper bound to the additional latency resulting due to FEC application. The MC Service server may perform this request several times to protect separately different sets of media transported within the same 5G MBS session.

2. If the MBSF can satisfy the request, the Setup FEC response includes a modified list of media information and FEC information. The response also includes an identifier of the corresponding FEC process instance, which can be used to release the application of FEC for these media flows.

NOTE 1: Source media packets may be modified by the application of FEC (e.g. addition of a footer or header), leading to a modification of the delivery protocol to be announced within the media information.

NOTE 2: The Release FEC request is not shown in the figure.

Editor's note: How to implement the FEC request/response is FFS and up to SA4 to specify.

3. The MC service server announces the 5G MBS session to the MC service client with the MBS session announcement procedure, including the modified list of media information and FEC information within the SDP information.

4. When the MC service server decides to transmit the MC service media flow for a group communication, the MC service server sends to the group a message identifying the MC service media flow and the TMGI of the 5MBS session, such as the MapGroupToSessionStream message for MCPTT or MCVideo.

5. The MC service server sends the downlink media to the MBSTF over Nmb8.

6. The MBSTF performs FEC encoding of the downlink media in accordance to the announced FEC algorithm and parameters and delivers it over 5G MBS.

7. The MC service client performs FEC decoding of the encoded media flows in accordance with the announced FEC information and delivers the decoded flows to the media player.