**3GPP TSG-RAN WG2 #131bis**

**Prague, Czech Republic, 13th – 17th October 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *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 | **X** | Core Network |  |

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| ***Title:*** | Introducing SR resources in LTM cell switch MAC CE [LTM\_enh\_SR] | | | | | | | | | |
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| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | |  |
|  | *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)* | |
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| ***Reason for change:*** | | Using a configured grant seems the best solution for LTM, as the UE would be free to transmit the RRCReconfigurationComplete message within the need to ask for a grant from the network. However, since the times when CHO was specified, reserving (grant) resources for a long time is a big burden for the network, as such resources are scarse and also needs to be shared also with other UEs.  Since it is not feasible to have a configured grant in each configured LTM candidate cell, the consequence of this is that network most likely will rely heavily of the dynamic grant for the case of LTM. Otherwise, if only configured grant is used this means that only a few LTM candidate cells can be configured at the UE, which translates in lower performance and reliability to handle mobility scenarios.  Because of this, the proposal would be to provide a shorter SR periodicity as possible to the UE so to not delay the sending of the RRCReconfigurationComplete message, in case the dynamic grant is used. However, in order for the network to do the UE needs to report to be capable to receive the LTM cell switch command MAC CE with the SR periodicity included. | | | | | | | | |
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| ***Summary of change:*** | | Section 5.18.35  - Clarified that if the SR configuration ID is present in the Enhanced LTM cell switch MAC CE, the UE should consider the related SR configuration for the LTM cell switch procedure.  Section 6.1.3.75 and 6.1.3.75a  - Added new fields for the SR configuration resources ID in the legacy LTM Cell Switch Command MAC CE and the enhanced one. | | | | | | | | |
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| ***Consequences if not approved:*** | | If CR is not approved, in case dynamic grant is used for the LTM cell switch, the UE may delay the sending of the SR (because the SR periodicity can be quite large) and this will in turn increase the latency of the LTM cell switch procedure and the interruption of the user plane data | | | | | | | | |
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| ***Clauses affected:*** | | 5.18.35, 6.1.3.75, 6.1.3.75a | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.331 CR XXX | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS 38.306 CR XXX | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*START OF CHANGES*

### 5.18.35 (Enhanced) LTM Cell Switch Command

The network may instruct the UE to perform LTM cell switch procedure by sending the LTM Cell Switch Command MAC CE described in clause 6.1.3.75 or the Enhanced LTM Cell Switch Command MAC CE described in clause 6.1.3.75a. The Enhanced LTM Cell Switch Command MAC CE is used for MAC entity associated with MCG if the value of *ltm-NoSecurityChangeID* contained within the *LTM-Candidate* associated with target configuration ID in *ltm-Config* is not equal to the value of stored *ltm-ServingCellNoSecurityChangeID* as specified in TS 38.331 [5]. Otherwise, the LTM Cell Switch MAC CE is used.

The MAC entity shall:

1> if the MAC entity receives an (Enhanced) LTM Cell Switch Command MAC CE on a Serving Cell:

2> indicate to upper layers that the LTM cell switch procedure is triggered and the Target Configuration ID included in the LTM Cell Switch Command MAC CE; or indicate to upper layers that the LTM cell switch procedure is triggered, the Target Configuration ID and the NCC value included in the Enhanced LTM Cell Switch Command MAC CE;

2> if the MAC reset operation as specified in clause 5.12 is performed, as requested by upper layers:

3> if Timing Advance Command value (hexa-decimal) is not set as FFF:

4> process the received Timing Advance Command (see clause 5.2);

4> consider the RACH-less LTM cell switch to be ongoing;

4> if the MAC entity is associated with the SCG:

5> indicate to upper layers to skip the Random Access procedure for this LTM cell switch.

3> else if the UE is configured with UE-based Timing Advance measurement as specified in TS 38.331 [5] and the UE has successfully measured the Timing Advance for the SpCell of the indicated LTM target configuration:

4> process the measured Timing Advance (see clause 5.2);

4> consider the RACH-less LTM cell switch to be ongoing.

4> if the MAC entity is associated with the SCG:

5> indicate to upper layers to skip the Random Access procedure for this LTM cell switch.

3> if the SR Configuration Resource ID is included in the (Enhanced) LTM Cell Switch Command MAC CE:

4> consider the associated physical layer resources on PUCCH related to the received SR Configuration Resource ID as the physical layer resources on where the UE may send the dedicated scheduling request (see clause 5.4.4);

3> indicate to lower layers the information regarding the TCI state information included in the LTM Cell Switch Command MAC CE or the Enhanced LTM Cell Switch Command MAC CE.

*END OF CHANGES*

*START OF CHANGES*

#### 6.1.3.75 LTM Cell Switch Command MAC CE

The LTM Cell Switch Command MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-1b. It has a variable size with following fields (Figure 6.1.3.75-1):

- R: Reserved bit, set to 0;

- Target Configuration ID: This field indicates the index of candidate target configuration to apply for LTM cell switch, corresponding to *ltm-CandidateId* minus 1as specified in TS 38.331 [5]. The length of the field is 3 bits;

- Timing Advance Command: This field indicates whether the TA is valid for the LTM target cell (i.e. the SpCell corresponding to the target configuration indicated by Target Configuration ID field). If the value of this field is set to FFF, this field indicates that no valid timing adjustment is available for the PTAG of the LTM target cell; otherwise, this field indicates the index value *TA* used to control the amount of timing adjustment that the MAC entity has to apply in TS 38.213 [6], and that the UE can skip the Random Access procedure for this LTM cell switch. If *tag-Id-ptr* is configured for the TCI state indicated by the UL TCI state ID field, if present, or by the TCI state ID field otherwise, in the LTM target cell and *tag-Id-ptr* is set to value *n1*, this field indicates the TA for the TAG indicated by the *tag2-Id* of the LTM target cell; otherwise, this field indicates the TA for the TAG indicated by the *tag-id* of the LTM target cell. The length of the field is 12 bits;

- TCI state ID: This field indicates and activates the TCI state for the LTM target cell (i.e. the SpCell of the target configuration indicated by the Target Configuration ID field). The TCI state is identified by *TCI-StateId* in *ltm-DL-OrJointTCI-StateToAddModList* as specified in TS 38.331 [5]. If the value of *unifiedTCI-StateType* in the *ltm-TCI-Info* of the configuration indicated by Target Configuration ID fieldis *joint*, this field is for joint TCI state, otherwise, this field is for downlink TCI state. The length of the field is 7 bits;

- UL TCI state ID: This field indicates and activates the uplink TCI state for the LTM target cell (i.e. the SpCell of the target configuration indicated by the Target Configuration ID field). The UL TCI state is identified by *TCI-UL-StateId* in *ltm-UL-TCI-StateToAddModList* as specified in TS 38.331 [5]. The octet containing this field (i.e. this field and the two reserved bits in the same octet) is included if the value of *unifiedTCI-StateType* in the *ltm-TCI-Info* of the configuration indicated by Target Configuration ID fieldis *separate*. The length of the field is 6 bits;

- C: This field indicates the presence of the contention-free Random Access Resources fields. If the value of this field is set to 1, the following fields are present: Random Access Preamble index field, S/U field, SS/PBCH index field, PRACH Mask index field, Repetition number field and the reserved bits in the same octet. If the value of this field is set to 0, these fields are absent.

- S/U: This field indicates which UL carrier to transmit the PRACH of the contention-free Random Access Resources. If the value of this field is set to 1, SUL is used; otherwise, NUL is used. The length of the field is 1 bit;

- Random Access Preamble index: This field indicates the Random Access Preamble index of the contention-free Random Access Resources. This field should not be set to 0b000000. The length of the field is 6 bits;

- SS/PBCH index: This field indicates the SS/PBCH that shall be used to determine the RACH occasion for the PRACH transmission of the contention-free Random Access Resources. The length of the field is 6 bits;

- PRACH Mask index: This field indicates the RACH occasion(s) associated with the SS/PBCH indicated by 'SS/PBCH index' for the PRACH transmission of the contention-free Random Access Resources. It indicates a subset of RACH occasion(s) from the *rach-ConfigDedicated* for the UL carrier (indicated by S/U field), (if provided, otherwise it indicates a subset of RACH occasion(s) from the *rach-ConfigCommon* for the UL carrier (indicated by S/U field) in the UL BWP configuration of *firstActiveUplinkBWP-Id* as specified in TS 38.331 [5]. When the repetition number field is not set to 0, the UE ignores this field. The length of the field is 4 bits;

- Repetition number: This field indicates the Msg1 repetition number to be applied to the contention-free Random Access. If this field is set to 0, Msg1 repetition number does not apply. If this field is set to 1, the Msg1 repetition number is 2. If this field is set to 2, the Msg1 repetition number is 4. If this field is set to 3, the Msg1 repetition number is 8. The length of the field is 2 bits.NOTE 1: A non-zero Msg1 repetition number value may only be included in the LTM Cell Switch Command MAC CE when the LTM target cell configuration has contention-based Random Access Resources with a *FeatureCombinationPreambles* with the same Msg1 repetition number value and *featureCombination* indicating only *msg1-Repetitions*;

- S: This field indicates the presence of the SR configuration resource index field. If the value of this field is set to 1 the field SR Configuration Resource ID is present, otherwise (if the field is set to 0) the field is absent;

- SR Configuration Resource ID: This field indicates the SR configuration resources to be used according to the indicated SR configuration index. The SR configuration index is identified by *schedulingRequestResourceId* within *ltm-SchedulingRequestResources* as specified in TS 38.331 [5]. The length of the field is 3 bits.



Figure 6.1.3.75-1: LTM Cell Switch Command MAC CE



Figure 6.1.3.75-2: Extended LTM Cell Switch Command MAC CE

NOTE 2: If UE receives the LTM Cell Switch Command MAC CE with a Target Configuration ID value not matching any configured *ltm-CandidateId* minus 1, as specified in TS 38.331 [5], the procedure of handling LTM Cell Switch Command MAC CE in clause 5.18.35 does not apply.

#### 6.1.3.75a Enhanced LTM Cell Switch Command MAC CE

The Enhanced LTM Cell Switch Command MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-1b. It has a variable size with following fields (Figure 6.1.3.75a-1):

- R: Reserved bit, set to 0;

- Target Configuration ID: This field indicates the index of candidate target configuration to apply for LTM cell switch, corresponding to *ltm-CandidateId* minus 1as specified in TS 38.331 [5]. The length of the field is 3 bits;

- Timing Advance Command: This field indicates whether the TA is valid for the LTM target cell (i.e. the SpCell corresponding to the target configuration indicated by Target Configuration ID field). If the value of this field is set to FFF, this field indicates that no valid timing adjustment is available for the PTAG of the LTM target cell; otherwise, this field indicates the index value *TA* used to control the amount of timing adjustment that the MAC entity has to apply in TS 38.213 [6], and that the UE can skip the Random Access procedure for this LTM cell switch. If *tag-Id-ptr* is configured for the TCI state indicated by the UL TCI state ID field, if present, or by the TCI state ID field otherwise, in the LTM target cell and *tag-Id-ptr* is set to value *n1*, this field indicates the TA for the TAG indicated by the *tag2-Id* of the LTM target cell; otherwise, this field indicates the TA for the TAG indicated by the *tag-id* of the LTM target cell. The length of the field is 12 bits;

- TCI state ID: This field indicates and activates the TCI state for the LTM target cell (i.e. the SpCell of the target configuration indicated by the Target Configuration ID field). The TCI state is identified by *TCI-StateId* in *ltm-DL-OrJointTCI-StateToAddModList* as specified in TS 38.331 [5]. If the value of *unifiedTCI-StateType* in the *ltm-TCI-Info* of the configuration indicated by Target Configuration ID fieldis *joint*, this field is for joint TCI state, otherwise, this field is for downlink TCI state. The length of the field is 7 bits;

- UL TCI state ID: This field indicates and activates the uplink TCI state for the LTM target cell (i.e. the SpCell of the target configuration indicated by the Target Configuration ID field). The UL TCI state is identified by *TCI-UL-StateId* in *ltm-UL-TCI-StateToAddModList* as specified in TS 38.331 [5]. The octet containing this field (i.e. this field and the two reserved bits in the same octet) is included if the value of *unifiedTCI-StateType* in the *ltm-TCI-Info* of the configuration indicated by Target Configuration ID fieldis *separate*. The length of the field is 6 bits;

- C: This field indicates the presence of the contention-free Random Access Resources fields. If the value of this field is set to 1, the following fields are present: Random Access Preamble index field, S/U field, SS/PBCH index field, PRACH Mask index field, Repetition number field. If the value of this field is set to 0, the Random Access Preamble index field, S/U field, SS/PBCH index field, PRACH Mask index field, Repetition number field are absent, and the corresponding bits for S/U field and Repetition number field are reserved.

- NCC value: This field indicates the NCC value used to update the KgNB key. The NCC value is identified by *NextHopChainingCount* as specified in TS 38.331 [5]. The length of the field is 3 bits.

- S/U: This field indicates which UL carrier to transmit the PRACH of the contention-free Random Access Resources. If the value of this field is set to 1, SUL is used; otherwise, NUL is used. The length of the field is 1 bit;

- Random Access Preamble index: This field indicates the Random Access Preamble index of the contention-free Random Access Resources. This field should not be set to 0b000000. The length of the field is 6 bits;

- SS/PBCH index: This field indicates the SS/PBCH that shall be used to determine the RACH occasion for the PRACH transmission of the contention-free Random Access Resources. The length of the field is 6 bits;

- PRACH Mask index: This field indicates the RACH occasion(s) associated with the SS/PBCH indicated by ‘SS/PBCH index’ for the PRACH transmission of the contention-free Random Access Resources. It indicates a subset of RACH occasion(s) from the *rach-ConfigDedicated* for the UL carrier (indicated by S/U field), (if provided, otherwise it indicates a subset of RACH occasion(s) from the *rach-ConfigCommon* for the UL carrier (indicated by S/U field) in the UL BWP configuration of *firstActiveUplinkBWP-Id* as specified in TS 38.331 [5]. When the repetition number field is not set to 0, the UE ignores this field. The length of the field is 4 bits;

- Repetition number: This field indicates the Msg1 repetition number to be applied to the contention-free Random Access. If this field is set to 0, Msg1 repetition number does not apply. If this field is set to 1, the Msg1 repetition number is 2. If this field is set to 2, the Msg1 repetition number is 4. If this field is set to 3, the Msg1 repetition number is 8. The length of the field is 2 bits;

- S: This field indicates the presence of the SR configuration resource index field. If the value of this field is set to 1 the field SR Configuration Resource ID is present, otherwise (if the field is set to 0) the field is absent;

- SR Configuration Resource ID: This field indicates the SR configuration resources to be used according to the indicated SR configuration index. The SR configuration index is identified by *schedulingRequestResourceId* within *ltm-SchedulingRequestResources* as specified in TS 38.331 [5]. The length of the field is 3 bits.

NOTE 1: A non-zero Msg1 repetition number value may only be included in the Enhanced LTM Cell Switch Command MAC CE when the LTM target cell configuration has contention-based Random Access Resources with a *FeatureCombinationPreambles* with the same Msg1 repetition number value and *featureCombination* indicating only *msg1-Repetitions*.



Figure 6.1.3.75a-1: Enhanced LTM Cell Switch Command MAC CE

NOTE 2: If UE receives the Enhanced LTM Cell Switch Command MAC CE with a Target Configuration ID value not matching any configured *ltm-CandidateId* minus 1, as specified in TS 38.331 [5], the procedure of handling Enhanced LTM Cell Switch Command MAC CE in clause 5.18.35 does not apply.

*END OF CHANGES*