**3GPP TSG-SA2 Meeting #154 *S2-220xxxx***

**Toulouse, France, Nov 14 - 18, 2022 (revision of)**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **23.273** | **CR** | **0xxx** | **rev** | **-** | **Current version:** | **17.6.0** |  |
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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 | **X** |

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| ***Title:***  | Support of LCS for UE accessing via Mobile Base Station Relay |
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| ***Source to WG:*** | Qualcomm Incoporated |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | DUMMY |  | ***Date:*** | 2022-11-04 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***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 canbe 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)Rel-19 (Release 19)* |
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| ***Reason for change:*** | The FS\_VMR study has concluded for normative work as documented in TR 23.700-05. This CR introduced the general description of the enhancement to LCS to support the Mobile Base Station Relay (MBSR) operation.  |
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| ***Summary of change:*** | Add a new clause to describe the system enhancements for the support of Mobile Base Station Relay operation.  |
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| ***Consequences if not approved:*** | Location service via Mobile Base Station Relay cannot be supported.  |
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| ***Clauses affected:*** |  (new) 5.x.  |
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|  | **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 ... |
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| ***Other comments:*** | This CR is part of outcome of SI FS\_VMR and the WI code for the work is not assigned yet & will replace WI code DUMMY when available |
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| ***This CR's revision history:*** |  |

\* \* \* Start of Changes \* \* \*

## 5.x Support of LCS for UEs accessing via a MBSR

### 5.x.1 General

For a UE accessing 5GS via a Mobile Base Station Relay (MBSR) as defined in TS 23.501 [18] clause 5.x, all existing procedures can be used, e.g. performing location measurements and SRS transmission. The UE reports the cell IDs of all the cells the UE performed DL positioning measurements on.

As the MBSR may be moving, the location service procedures need to be enhanced as following for an accurate estimation of the UE positioning:

- For a MBSR participated in the location service procedures for the UE, it includes it's cell ID in the reported UL positioning measurement.

- The AMF serving the UE provides the cell ID of serving cell of the UE to the LMF in the location request (legacy behaviour) and indicates if the cell ID belongs to a MBSR. The AMF serving the UE also provides LMF with the IAB-UE ID of the MBSR so that the LMF can initiates the positioning procedure to obtain the location information of the MBSR.

Editor's note: How the AMF serving UE obtains the IAB-UE ID of the MBSR e.g. from gNB or NRF, will be specified.

Editor's note: It is FFS whether the AMF provides more parameters related to the MBSR to the LMF.

- Additionally, the LMF uses the UE reported cell IDs to derive whether the cell ID corresponds to a MBSR. There can be more than one MBSR in the measurement report.

- To aid the LMF to estimate the accuracy of the UE location estimation, the MBSR velocity information and time for obtaining its location measurement data should be obtained by the LMF when available.

### 5.x.2 Obtaining location information for the MBSR

There are multiple options for an LMF to obtain the location information and velocity of the MBSR(s):

- The LMF can derive the location of the MBSR by triggering the AMF serving the MBSR, or the gNB serving the MBSR or by requesting the GMLC to derive the location of the MBSR (UE).

- As the timing of the location estimations for the Target UE and MBSR(s) is important for the quality of the location estimation of the Target UE, the LMF needs to reduce the timing offset of the positioning measurements, e.g. using scheduled location time and compensate for the potential time difference of the positioning measurements, e.g. taking velocity of MBSR into account.

### 5.x.3 Privacy check for MBSR

If the MBSR acts as a UE for the positioning, the UE privacy check procedure needs to be performed.

If the positioning of the MBSR is performed for the UE served by the MBSR, the privacy check procedure is skipped.

Editor’s Note: The mechanism to skip the privacy check will be specified based on the procedure used by the LMF to obtain the location of MBSR.

\* \* \* End of Changes \* \* \*