**3GPP TSG-RAN WG2 Meeting #121-bis-eR2-23xxxx**

**Online, 17th April – 26th April 2023 Revision of R2-2304052**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **05** | **CR** | **0125** | **rev** | **1** | **Current version:** |  |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network | **X** | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Update of information transfer from gNB to LMF | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh-Core | | | | |  | ***Date:*** | | | 2023-04-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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:*** | | Currently TS 38.305 mentions that gNB informs to LMF regarding the UE UL SRS configuration release. However, the stage3 TS 38.455 does not support such configuration release information from gNB to LMF. Hence, this needs to be corrected.  However, TS 38.455 in v17.4.0 the below information has been added  If the *SRS Transmission Status* IE is included in the POSITIONING INFORMATION UPDATE message and set to "stopped", the LMF shall consider that the SRS transmission has stopped.   |  |  |  |  | | --- | --- | --- | --- | | SRS Transmission Status | O |  | ENUMERATED (stopped, ...) | | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The information transfer from gNB to LMF has been updated to include  *SRS Transmission Status* and positioning information update from gNB to LMF has been corrected.  **Impact Analysis**  Impacted 5G architecture options: NR SA, (NG)EN-DC, NE-DC,NR-DC  Impacted functionality:  Assistance Data Delivery and Assistance Data Request  Inter-operability:   * There are no interoperability issues. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incomplete and Incorrect specification | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.10.2.3, 8.10.3.2.1, 8.13.2.1, 8.13.3.2.1,8.14.3.2, 8.14.3.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

*Beginning of Changes*

#### 8.10.2.3 Information that may be transferred from the gNB to LMF

The assistance data that may be transferred from gNB to the LMF is listed in Table 8.10.2.3-1.

Table 8.10.2.3-1: Assistance data that may be transferred from gNB to the LMF

|  |
| --- |
| Information |
| PCI, GCI, ARFCN and TRP IDs of the TRPs served by the gNB |
| Timing information of TRPs served by the gNB |
| DL-PRS configuration of the TRPs served by the gNB |
| SSB information of the TRPs (the time/frequency occupancy of SSBs) |
| Spatial direction information of the DL-PRS Resources of the TRPs served by the gNB |
| Geographical coordinates information of the DL-PRS Resources of the TRPs served by the gNB |
| TRP type |
| On-demand DL-PRS information |
| TRP Tx TEG association information |

The configuration data for a target UE that may be transferred from the serving gNB to the LMF is listed in Table 8.10.2.3-2.

Table 8.10.2.3-2: UL information/UE configuration data that may be transferred from serving gNB to the LMF

|  |
| --- |
| UE configuration data |
| UE SRS configuration |
| SFN initialization time for the SRS configuration |
| SRS Transmission Status |

<Skip Unmodified Changes>

*Next changes*

#### 8.10.3.2 Procedures between LMF and gNB

##### 8.10.3.2.1 Assistance Data Delivery between LMF and gNB

The purpose of these procedures is to enable the gNB to provide assistance data described in Table 8.10.2.3-1 to the LMF, for subsequent delivery to the UE using the procedures of clause 8.10.3.1.2.1 or for use in the calculation of positioning estimates at the LMF or enable the LMF to request UL-SRS configuration information from the serving gNB of a target UE.

Figure 8.10.3.2.1-1 shows the TRP Information Exchange operation from the gNB to the LMF for the Multi-RTT positioning method.



Figure 8.10.3.2.1-1: LMF-initiated TRP Information Exchange Procedure

(1) The LMF determines that certain TRP configuration information is desired (e.g., as part of a periodic update or as triggered by OAM) and sends an NRPPa TRP INFORMATION REQUEST message to the gNB. This request includes an indication of which specific TRP configuration information is requested.

(2) The gNB provides the requested TRP information in an NRPPa TRP INFORMATION RESPONSE message, if available at the gNB. If the gNB is not able to provide any information, it returns an TRP INFORMATION FAILURE message indicating the cause of the failure.

Figure 8.10.3.2.1-2 shows the UL information Delivery operation from the serving gNB to the LMF.



Figure 8.10.3.2.1-2: LMF-initiated UL Information Request Procedure

(1) The LMF sends a NRPPa message POSITIONING INFORMATION REQUEST to the serving gNB of the target UE to request UE SRS configuration information. If the message includes the Requested UL-SRS Transmission Characteristics as listed in Table 8.10.2.4-1, the gNB should take this information into account when configuring UL-SRS transmissions for the UE.

(2) The serving gNB determines the UE SRS configuration to be allocated for the UE and sends NRPPa message POSITIONING INFORMATION RESPONSE to the LMF that includes the UE SRS configuration defined in Table 8.10.2.3-2. If the serving gNB is not able to provide the requested information, it returns a failure message indicating the cause of the failure.

(3) If a change has occurred in the UE SRS configuration during the UE SRS time duration requested at step 1, the gNB sends a POSITIONING INFORMATION UPDATE message to the LMF. This message contains, in the case of a change in UE SRS configuration parameters, the UE SRS configuration information for all cells with UE SRS configured, or an update in SRS transmission status.

*Next Change*

#### 8.13.2.1 Configuration Data that may be transferred from the gNB to the LMF

The configuration data for a target UE that may be transferred from the serving gNB to the LMF is listed in Table 8.13.2.1-1.

Table 8.13.2.1-1: UE configuration data that may be transferred from serving gNB to the LMF

|  |
| --- |
| UE configuration data |
| UE SRS configuration |
| Timing information of the TRP, which configured the UE SRS transmission |
| The association information of SRS resources with UE Tx TEG ID |
| SRS Transmission Status |

*Next Change*

#### 8.13.3.2 Assistance Data Transfer Procedure

##### 8.13.3.2.1 Assistance Data Delivery between LMF and gNB

The purpose of these procedures is to enable the gNB to provide assistance data described in Table 8.13.2.0-1 to the LMF, for subsequent delivery to the gNB using the procedures of clause 8.13.3.3 or for use in the calculation of positioning estimates at the LMF or enable the LMF to request UL-SRS configuration information from the serving gNB of a target UE.

Figure 8.13.3.2.1-1 shows the UL information Delivery operation from the serving gNB to the LMF.



Figure 8.13.3.2.1-1: LMF-initiated UL Information Request Procedure

(1) The LMF sends a NRPPa message POSITIONING INFORMATION REQUEST to the serving gNB of the target UE to request UE SRS configuration information. If the message includes the Requested UL-SRS Transmission Characteristics as listed in Table 8.13.2.3-1, the gNB should take this information into account when configuring UL-SRS transmissions for the UE.

(2) The serving gNB determines the UE SRS configuration to be allocated for the UE and sends NRPPa message POSITIONING INFORMATION RESPONSE to the LMF that includes the UE SRS configuration defined in Table 8.13.2.1-1. If the serving gNB is not able to provide the requested information, it returns a failure message indicating the cause of the failure.

(3) If a change has occurred in the UE SRS configuration during the UE SRS time duration requested at step 1, the gNB sends a POSITIONING INFORMATION UPDATE message to the LMF. This message contains, in the case of a change in UE SRS configuration parameters, the UE SRS configuration information for all cells with UE SRS configured, or an update in SRS transmission status.

Figure 8.13.3.2.1-2 shows the TRP Information Exchange operation from the gNB to the LMF for the UL-TDOA positioning method.

*Next Change*

#### 8.14.2.1 Configuration Data that may be transferred from the gNB to the LMF

The configuration data for a target UE that may be transferred from the serving gNB to the LMF is listed in Table 8.14.2.1-1.

Table 8.14.2.1-1: UE configuration data that may be transferred from serving gNB to the LMF

|  |
| --- |
| UE configuration data |
| UE SRS configuration |
| Timing information of the TRP, which configured the UE SRS transmission |
| SRS Transmission Status |

*Next Change*

#### 8.14.3.2 Assistance Data Transfer Procedure

##### 8.14.3.2.1 Assistance Data Delivery between LMF and gNB

The purpose of these procedures is to enable the gNB to provide assistance data described in Table 8.14.2.0-1 to the LMF, for subsequent delivery to the gNB using the procedures of clause 8.14.3.3 or for use in the calculation of positioning estimates at the LMF or enable the LMF to request UL-SRS configuration information from the serving gNB of a target UE.

Figure 8.14.3.2.1-1 shows the UL information Delivery operation from the serving gNB to the LMF.



Figure 8.14.3.2.1-1: LMF-initiated UL Information Request Procedure

(1) The LMF sends a NRPPa message POSITIONING INFORMATION REQUEST to the serving gNB of the target UE to request UE SRS configuration information. If the message includes the Requested UL-SRS Transmission Characteristics as listed in Table 8.14.2.3-1, the gNB should take this information into account when configuring UL-SRS transmissions for the UE.

(2) The serving gNB determines the UE SRS configuration to be allocated for the UE and sends NRPPa message POSITIONING INFORMATION RESPONSE to the LMF that includes the UE SRS configuration defined in Table 8.14.2.1-1. If the serving gNB is not able to provide the requested information, it returns a failure message indicating the cause of the failure.

(3) If a change has occurred in the UE SRS configuration during the UE SRS time duration requested at step 1, the gNB sends a POSITIONING INFORMATION UPDATE message to the LMF. This message contains, in the case of a change in UE SRS configuration parameters, the UE SRS configuration information for all cells with UE SRS configured, or an update in SRS transmission status.

Figure 8.14.3.2.1-2 shows the TRP Information Exchange operation from the gNB to the LMF for the UL-AoA positioning method.

*Next Change*