**3GPP TSG-RAN WG2 Meeting #127 *R2-24xxxxx***

**Maastricht, Netherlands, August 19 – 23, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.305** | **CR** | **xxxx** | **rev** | **-** | **Current version:** | **18.2.0** |  |
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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 |  | Core Network | **x** |

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| ***Title:*** | Correction to LPP Measurement Time Windows and SLPP Assistance Data Transfer procedures | | | | | | | | | |
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| ***Source to WG:*** | Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2-Core | | | | |  | ***Date:*** | | | 2024-08-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | 1. The LPP Request Location Information message for Multi-RTT, DL-AoD, and DL-TDOA may include one or more time windows during which the target device is requested to perform the DL-PRS measurements. One purpose of the time windows is to ensure that the requested measurements are performed at the same time by two devices, e.g., target UE and PRU, which isn't clear from the current description. 2. The SLPP Assistance Data transfer procedures include a Note 3 that Endpoint A may be a SL-PRS Tx UE and Endpoint B may be a SL-PRS Rx UE. However, the Tx and Rx endpoints are mistakenly reversed. | | | | | | | | |
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| ***Summary of change:*** | | 1. A Note is added that a LMF may provide the same configurations of time windows to two devices e.g., target UE and PRU, for simultaneous measurements by the two devices. 2. The Note 3 for the SLPP Assistance Data transfer procedures is corrected. | | | | | | | | |
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| ***Consequences if not approved:*** | | Wrong and unclear Stage 2 descriptions would remain in the specification. | | | | | | | | |
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| ***Clauses affected:*** | | 8.10.3.1.3.1, 8.11.3.1.3.1, 8.12.3.1.3.1, 8.15.2.2.2, 8.15.3.2.2, 8.15.4.2.2, 8.15.5.2.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

###### 8.10.3.1.3.1 LMF-initiated Location Information Transfer Procedure

Figure 8.10.3.1.3.1-1 shows the Location Information Transfer operations for the Multi-RTT positioning method when the procedure is initiated by the LMF.



Figure 8.10.3.1.3.1-1: LMF-initiated Location Information Transfer Procedure

(1) The LMF sends an LPP Request Location Information message to the UE. This request includes indication of Multi-RTT measurements requested, including any needed measurement configuration information, and required response time.  
The LPP Request Location Information message may include one or more time windows during which the target device is requested to perform the Multi-RTT measurements on indicated DL-PRS Resource Sets.  
The LPP Request Location Information message may include a request to perform joint UE Rx-Tx time difference measurement(s) across two or three DL-PRS positioning frequency layers.  
The LPP Request Location Information message may include a request to perform the Multi-RTT measurements using receiver frequency hopping for a DL PRS resource within a configured measurement gap.

NOTE: The LMF may provide the same configurations of time windows to two devices e.g., target UE and PRU, for simultaneous measurements by the two devices.

(2) The UE obtains Multi-RTT measurements as requested in step 1. The UE then sends an LPP Provide Location Information message to the LMF, before the Response Time provided in step (1) elapsed, and includes the obtained Multi-RTT measurements. If the UE is unable to perform the requested measurements, or the Response Time elapsed before any of the requested measurements were obtained, the UE returns any information that can be provided in an LPP message of type Provide Location Information which includes a cause indication for the not provided location information.

###### 8.11.3.1.3.1 LMF-initiated Location Information Transfer Procedure

Figure 8.11.3.1.3.1-1 shows the Location Information Transfer operations for the DL-AoD positioning method when the procedure is initiated by the LMF.



Figure 8.11.3.1.3.1-1: LMF-initiated Location Information Transfer Procedure

(1) The LMF sends an LPP Request Location Information message to the UE. This request includes positioning instructions such as the positioning mode (UE-assisted, UE-based, UE-based preferred but UE-assisted allowed, UE-assisted preferred, but UE-based allowed), indication of DL-AoD measurements requested if any, including any needed measurement configuration information, required response time, and possibly integrity requirements.   
The LPP Request Location Information message may include one or more time windows during which the target device is requested to perform the DL-AoD measurements on indicated DL-PRS Resource Sets.  
The LPP Request Location Information message may include a request to perform the DL-AoD measurements using receiver frequency hopping for a DL PRS resource within a configured measurement gap.

NOTE: The LMF may provide the same configurations of time windows to two devices e.g., target UE and PRU, for simultaneous measurements by the two devices.

(2) The UE obtains DL-AoD measurements as requested in step 1 and possibly calculates its own location. The UE may also determine the integrity results of the calculated location. The UE then sends an LPP Provide Location Information message to the LMF, before the Response Time provided in step (1) elapsed, and includes the obtained DL-AoD measurements or calculated location. If the UE is unable to perform the requested measurements, or the Response Time elapsed before any of the requested measurements were obtained, the UE returns any information that can be provided in an LPP message of type Provide Location Information which includes a cause indication for the not provided location information.

###### 8.12.3.1.3.1 LMF-initiated Location Information Transfer Procedure

Figure 8.12.3.1.3.1-1 shows the Location Information Transfer operations for the DL-TDOA positioning method when the procedure is initiated by the LMF.



Figure 8.12.3.1.3.1-1: LMF-initiated Location Information Transfer Procedure

(1) The LMF sends an LPP Request Location Information message to the UE. This request includes positioning instructions such as the positioning mode (UE-assisted, UE-based, UE-based preferred but UE-assisted allowed, UE-assisted preferred, but UE-based allowed), indication of DL-TDOA measurements requested if any, including any needed measurement configuration information, required response time, and possibly integrity requirements.   
The LPP Request Location Information message may include one or more time windows during which the target device is requested to perform the DL-TDOA measurements on indicated DL-PRS Resource Sets.  
The LPP Request Location Information message may include a request to perform joint DL-RSTD measurements across two or three DL-PRS positioning frequency layers.  
The LPP Request Location Information message may include a request to perform the DL-TDOA measurements using receiver frequency hopping for a DL PRS resource within a configured measurement gap.

NOTE: The LMF may provide the same configurations of time windows to two devices e.g., target UE and PRU, for simultaneous measurements by the two devices.

(2) The UE obtains DL-TDOA measurements as requested in step 1 and possibly calculates its own location. The UE may also determine the integrity results of the calculated location. The UE then sends an LPP Provide Location Information message to the LMF, before the Response Time provided in step (1) elapsed, and includes the obtained DL-TDOA measurements or calculated location. If the UE is unable to perform the requested measurements, or the Response Time elapsed before any of the requested measurements were obtained, the UE returns any information that can be provided in an LPP message of type Provide Location Information which includes a cause indication for the not provided location information.

##### 8.15.2.2.2 Assistance Data transfer procedure

Figure 8.15.2.2.2-1 shows the Assistance Data transfer operations for the SL-RTT positioning method.



Figure 8.15.2.2.2-1: Assistance Data transfer procedure.

1. Endpoint A may determine that certain SL-RTT positioning assistance data are desired and sends an SLPP Request Assistance Data message to Endpoint B. This request includes an indication of which specific SL-RTT assistance data are requested.

2. If step 1 occurred, Endpoint B provides the requested assistance in an SLPP Provide Assistance Data message to Endpoint A, if available at Endpoint B. The assistance data that may be signalled are listed in Table 8.15.2.2.2-1. If any of the requested assistance data in step 1 are not provided in step 2, the Endpoint A shall assume that the requested assistance data are not supported, or currently not available at Endpoint B. If none of the requested assistance data in step 1 can be provided by Endpoint B, Endpoint B returns any information that can be provided in an SLPP message of type Provide Assistance Data which includes a cause indication for the not provided assistance data.  
If step 1 did not occur, Endpoint B determines that SL-RTT assistance data needs to be provided to Endpoint A (e.g., as part of a positioning procedure) and sends an SLPP Provide Assistance Data message to Endpoint A.

NOTE 1: Dependent on the scenario, Endpoint A may be a SL Target UE and Endpoint B may be a SL Server UE or LMF.

NOTE 2: Dependent on the scenario, Endpoint A may be a SL Target UE or SL Server UE and Endpoint B may be a SL Anchor UE.

NOTE 3: Dependent on the scenario, Endpoint A may be a SL-PRS receiving (Rx) UE and Endpoint B may be a SL-PRS transmitting (Tx) UE.

Table 8.15.2.2.2-1: Assistance data that may be transferred between endpoints.

|  |
| --- |
| Information |
| Application Layer ID, identifying a UE as defined in TS 23.287 [48], for which the assistance data are applicable |
| SL-PRS Sequence ID as defined in TS 38.211 [50] |
| Anchor UE location coordinates |
| SL-PRS Tx ARP location coordinates |
| SL-PRS Tx Information (SL-PRS Priority, SL-PRS Delay Budget, SL-PRS Bandwidth, SL-PRS Periodicity, SL-PRS Tx trigger indication) |
| Association information between SL-PRS Tx ARP-ID and the already transmitted SL PRS resource(s) |

##### 8.15.3.2.2 Assistance Data transfer procedure

Figure 8.15.3.2.2-1 shows the Assistance Data transfer operations for the SL-AoA positioning method.



Figure 8.15.3.2.2-1: Assistance Data transfer procedure.

1. Endpoint A may determine that certain SL-AoA positioning assistance data are desired and sends an SLPP Request Assistance Data message to Endpoint B. This request includes an indication of which specific SL-AoA assistance data are requested.

2. If step 1 occurred, Endpoint B provides the requested assistance in an SLPP Provide Assistance Data message to Endpoint A, if available at Endpoint B. The assistance data that may be signalled are listed in Table 8.15.3.2.2-1. If any of the requested assistance data in step 1 are not provided in step 2, the Endpoint A shall assume that the requested assistance data are not supported, or currently not available at Endpoint B. If none of the requested assistance data in step 1 can be provided by Endpoint B, Endpoint B returns any information that can be provided in an SLPP message of type Provide Assistance Data which includes a cause indication for the not provided assistance data.  
If step 1 did not occur, Endpoint B determines that SL-AoA assistance data needs to be provided to Endpoint A (e.g., as part of a positioning procedure) and sends an SLPP Provide Assistance Data message to Endpoint A.

NOTE 1: Dependent on the scenario, Endpoint A may be a SL Target UE and Endpoint B may be a SL Server UE or LMF.

NOTE 2: Dependent on the scenario, Endpoint A may be a SL Target UE or SL Server UE and Endpoint B may be a SL Anchor UE.

NOTE 3: Dependent on the scenario, Endpoint A may be a SL-PRS receiving (Rx) UE and Endpoint B may be a SL-PRS transmitting (Tx) UE.

Table 8.15.3.2.2-1: Assistance data that may be transferred between endpoints.

|  |
| --- |
| Information |
| Application Layer ID, identifying a UE as defined in TS 23.287 [48], for which the assistance data are applicable |
| SL-PRS Sequence ID as defined in TS 38.211 [50] |
| Anchor UE location coordinates |
| SL-PRS Tx ARP location coordinates |
| SL-PRS Tx Information (SL-PRS Priority, SL-PRS Delay Budget, SL-PRS Bandwidth, SL-PRS Periodicity, SL-PRS Tx trigger indication) |
| Association information between SL-PRS Tx ARP-ID and the already transmitted SL PRS resource(s) |
| Expected AoA and uncertainty |

##### 8.15.4.2.2 Assistance Data transfer procedure

Figure 8.15.4.2.2-1 shows the Assistance Data transfer operations for the SL-TDOA positioning method.



Figure 8.15.4.2.2-1: Assistance Data transfer procedure.

1. Endpoint A may determine that certain SL-TDOA positioning assistance data are desired and sends an SLPP Request Assistance Data message to Endpoint B. This request includes an indication of which specific SL-TDOA assistance data are requested.

2. If step 1 occurred, Endpoint B provides the requested assistance in an SLPP Provide Assistance Data message to Endpoint A, if available at Endpoint B. The assistance data that may be signalled are listed in Table 8.15.4.2.2-1. If any of the requested assistance data in step 1 are not provided in step 2, the Endpoint A shall assume that the requested assistance data are not supported, or currently not available at Endpoint B. If none of the requested assistance data in step 1 can be provided by Endpoint B, Endpoint B returns any information that can be provided in an SLPP message of type Provide Assistance Data which includes a cause indication for the not provided assistance data.  
If step 1 did not occur, Endpoint B determines that SL-TDOA assistance data needs to be provided to Endpoint A (e.g., as part of a positioning procedure) and sends an SLPP Provide Assistance Data message to Endpoint A.

NOTE 1: Dependent on the scenario, Endpoint A may be a SL Target UE and Endpoint B may be a SL Server UE or LMF.

NOTE 2: Dependent on the scenario, Endpoint A may be a SL Target UE or SL Server UE and Endpoint B may be a SL Anchor UE.

NOTE 3: Dependent on the scenario, Endpoint A may be a SL-PRS receiving (Rx) UE and Endpoint B may be a SL-PRS PRS transmitting (Tx) UE.

Table 8.15.4.2.2-1: Assistance data that may be transferred between endpoints.

|  |
| --- |
| Information |
| Application Layer ID, identifying a UE as defined in TS 23.287 [48], for which the assistance data are applicable |
| SL-PRS Sequence ID as defined in TS 38.211 [50] |
| Anchor UE location coordinates |
| SL-PRS Tx ARP location coordinates |
| SL-PRS Tx Information (SL-PRS Priority, SL-PRS Delay Budget, SL-PRS Bandwidth, SL-PRS Periodicity, SL-PRS Tx trigger indication) |
| Association information between SL-PRS Tx ARP-ID and the already transmitted SL PRS resource(s) |
| Synchronization information between anchor UEs (RTDs) |

##### 8.15.5.2.2 Assistance Data transfer procedure

Figure 8.15.5.2.2-1 shows the Assistance Data transfer operations for the SL-TOA positioning method.



Figure 8.15.5.2.2-1: Assistance Data transfer procedure.

1. Endpoint A may determine that certain SL-TOA positioning assistance data are desired and sends an SLPP Request Assistance Data message to Endpoint B. This request includes an indication of which specific SL-TOA assistance data are requested.

2. If step 1 occurred, Endpoint B provides the requested assistance in an SLPP Provide Assistance Data message to Endpoint A, if available at Endpoint B. The assistance data that may be signalled are listed in Table 8.15.5.2.2-1. If any of the requested assistance data in step 1 are not provided in step 2, the Endpoint A shall assume that the requested assistance data are not supported, or currently not available at Endpoint B. If none of the requested assistance data in step 1 can be provided by Endpoint B, Endpoint B returns any information that can be provided in an SLPP message of type Provide Assistance Data which includes a cause indication for the not provided assistance data.  
If step 1 did not occur, Endpoint B determines that SL-TOA assistance data needs to be provided to Endpoint A (e.g., as part of a positioning procedure) and sends an SLPP Provide Assistance Data message to Endpoint A.

NOTE 1: Dependent on the scenario, Endpoint A may be a SL Target UE and Endpoint B may be a SL Server UE or LMF.

NOTE 2: Dependent on the scenario, Endpoint A may be a SL Target UE or SL Server UE and Endpoint B may be a SL Anchor UE.

NOTE 3: Dependent on the scenario, Endpoint A may be a SL-PRS receiving (Rx) UE and Endpoint B may be a SL-PRS transmitting (Tx) UE.

Table 8.15.5.2.2-1: Assistance data that may be transferred between endpoints.

|  |
| --- |
| Information |
| Application Layer ID, identifying a UE as defined in TS 23.287 [48], for which the assistance data are applicable |
| SL-PRS Sequence ID as defined in TS 38.211 [50] |
| Anchor UE location coordinates |
| SL-PRS Tx ARP location coordinates |
| SL-PRS Tx Information (SL-PRS Priority, SL-PRS Delay Budget, SL-PRS Bandwidth, SL-PRS Periodicity, SL-PRS Tx trigger indication) |
| Association information between SL-PRS Tx ARP-ID and the already transmitted SL PRS resource(s) |
| Synchronization information between anchor UEs (RTDs) |