**3GPP TSG-RAN WG2 Meeting #121-bis-e *draftR2-2304319***

**Online, 17th – 26th April, 2023**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.355** | **CR** | - | **rev** | - | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

X

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Support positioning of L2 UE-to-network remote Ues | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MediaTek Inc., CATT, Huawei, HiSilicon, Qualcomm Incorporated, Xiaomi, Intel Corporation, vivo | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI18 | | | | |  | ***Date:*** | | | 2023-04-24 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The target device in a positioning operation may be configured as a L2 UE-to-Network Remote UE, which affects the operation of some positioning methods. The positioning server is not aware of such a configuration and may send inappopriate assistance data or request inappropriate measurements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. An indicator is added to CommonIEsProvideLocationInformation to notify the server that the target is configured as a L2 U2N Remote UE. 2. A NOTE is added to the field description of the new capability to indicate that the target device may send its capabilities when it starts or stops operation as a L2 U2N Remote UE. 3. An indicator is added to the TargetDeviceErrorCauses IEs for the GNSS, NR E-CID, NR DL-TDOA, NR DL-AoD, and NR Multi-RTT methods to notify the server that the target is configured as a L2 U2N Remote UE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | When the target device operates as a L2 U2N Remote UE, the server may trigger positioning operations that are not possible, resulting in a failed operation. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.4.2, 6.5.2.12, 6.5.9.6, 6.5.10.8, 6.5.11.8, 6.5.12.8 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.305 CR XXXX  TS 38.331 CR XXXX  TS 38.306 CR XXXX | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*Start of change*

6.4.2 Common Positioning

[…]

– *CommonIEsRequestCapabilities*

The *CommonIEsRequestCapabilities* carries common IEs for a Request Capabilities LPP message Type.

-- ASN1START

CommonIEsRequestCapabilities ::= SEQUENCE {

...,

[[

lpp-message-segmentation-req-r14 BIT STRING { serverToTarget (0),

targetToServer (1) } OPTIONAL -- Need ON

]],

[[

remoteUE-IndicationReq-r18 ENUMERATED { true } OPTIONAL -- Need ON

]]

}

-- ASN1STOP

| ***CommonIEsRequestCapabilities* field descriptions** |
| --- |
| ***lpp-message-segmentation-req***  This field, if present, indicates that the target device is requested to provide its LPP message segmentation capabilities.  If bit 0 is set to value 1, it indicates that the server is able to send segmented LPP messages to the target device; if bit 0 is set to value 0 it indicates that the server is not able to send segmented LPP messages to the target device.  If bit 1 is set to value 1, it indicates that the server is able to receive segmented LPP messages from the target device; if bit 1 is set to value 0 it indicates that the server is not able to receive segmented LPP messages from the target device. |
| ***remoteUE-IndicationReq***  This field, if present, indicates that the target device is requested to indicate if it operates as a L2 U2N Remote UE. |

– *CommonIEsProvideCapabilities*

The *CommonIEsProvideCapabilities* carries common IEs for a Provide Capabilities LPP message Type.

-- ASN1START

CommonIEsProvideCapabilities ::= SEQUENCE {

...,

[[

segmentationInfo-r14 SegmentationInfo-r14 OPTIONAL, -- Cond Segmentation

lpp-message-segmentation-r14 BIT STRING { serverToTarget (0),

targetToServer (1) } OPTIONAL

]],

[[

remoteUE-Indication-r18 BOOLEAN OPTIONAL -- Cond NR

]]

}

-- ASN1STOP

| **Conditional presence** | **Explanation** |
| --- | --- |
| *Segmentation* | This field is optionally present, need OP, if *lpp-message-segmentation-req* has been received from the location server with bit 1 (*targetToServer*) set to value 1. The field shall be omitted if *lpp‑message‑segmentation-req* has not been received in this location session, or has been received with bit 1 (*targetToServer*) set to value 0. |
| *NR* | This field is optionally present, need OR, for NR access. Otherwise it is not present. |

| ***CommonIEsProvideCapabilities* field descriptions** |
| --- |
| ***segmentationInfo***  This field indicates whether this *ProvideCapabilities* message is one of many segments, as specified in clause 4.3.5. |
| ***lpp-message-segmentation***  This field, if present, indicates the target device's LPP message segmentation capabilities.  If bit 0 is set to value 1, it indicates that the target device supports receiving segmented LPP messages; if bit 0 is set to value 0 it indicates that the target device does not support receiving segmented LPP messages.  If bit 1 is set to value 1, it indicates that the target device supports sending segmented LPP messages; if bit 1 is set to value 0 it indicates that the target device does not support sending segmented LPP messages. |
| ***remoteUE-Indication***  This field indicates whether the target device in NR access is configured as a L2 U2N Remote UE. The target device in NR access may transmit a *ProvideCapabilities* message with an appropriate value of this field when it starts or stops operation as a U2N Remote UE. |

*Next change*

6.5.2.12 GNSS Error Elements

[…]

– *GNSS-TargetDeviceErrorCauses*

The IE *GNSS-TargetDeviceErrorCauses* is used by the target device to provide GNSS error reasons to the location server.

-- ASN1START

GNSS-TargetDeviceErrorCauses ::= SEQUENCE {

cause ENUMERATED { undefined,

thereWereNotEnoughSatellitesReceived,

assistanceDataMissing,

notAllRequestedMeasurementsPossible,

...

},

fineTimeAssistanceMeasurementsNotPossible NULL OPTIONAL,

adrMeasurementsNotPossible NULL OPTIONAL,

multiFrequencyMeasurementsNotPossible NULL OPTIONAL,

...,

[[

remoteUE-Indication-r18 ENUMERATED {true} OPTIONAL -- Cond NR

]]

}

-- ASN1STOP

| **Conditional presence** | **Explanation** |
| --- | --- |
| *NR* | This field is optionally present, need OR, for NR access. Otherwise it is not present. |

| ***GNSS-TargetDeviceErrorCauses* field descriptions** |
| --- |
| ***cause***  This field provides a GNSS specific error cause. If the cause value is '*notAllRequestedMeasurementsPossible*', the target device was not able to provide all requested GNSS measurements (but may be able to report a location estimate or location measurements). In this case, the target device should include any of the *fineTimeAssistanceMeasurementsNotPossible*, *adrMeasurementsNotPossible*, or *multiFrequenceMeasurementsNotPossible* fields, as applicable. |
| ***remoteUE-Indication***  This field indicates whether the target device in NR access is configured as a L2 U2N Remote UE. |

*Next change*

6.5.9.6 NR E-CID Error Elements

[…]

– *NR-ECID-TargetDeviceErrorCauses*

The IE *NR-ECID-TargetDeviceErrorCauses* is used by the target device to provide NR E-CID error reasons to the location server.

-- ASN1START

NR-ECID-TargetDeviceErrorCauses-r16 ::= SEQUENCE {

cause-r16 ENUMERATED { undefined,

requestedMeasurementNotAvailable,

notAllrequestedMeasurementsPossible,

...

},

ss-RSRPMeasurementNotPossible-r16 NULL OPTIONAL,

ss-RSRQMeasurementNotPossible-r16 NULL OPTIONAL,

csi-RSRPMeasurementNotPossible-r16 NULL OPTIONAL,

csi-RSRQMeasurementNotPossible-r16 NULL OPTIONAL,

...,

[[

remoteUE-Indication-r18 ENUMERATED {true} OPTIONAL -- Cond NR

]]

}

-- ASN1STOP

| **Conditional presence** | **Explanation** |
| --- | --- |
| *NR* | This field is optionally present, need OR, for NR access. Otherwise it is not present. |

| ***NR-ECID-TargetDeviceErrorCauses* field descriptions** |
| --- |
| ***cause***  This field provides a NR E-CID specific error cause. If the cause value is 'notAllRequestedMeasurementsPossible', the target device was not able to provide all requested NR E-CID measurements (but may be able to provide some measurements). In this case, the target device should include any of the *ss-RSRPMeasurementNotPossible*, *ss-RSRQMeasurementNotPossible*, *csi-RSRPMeasurementNotPossible*, or *csi-RSRQMeasurementNotPossible* fields, as applicable. |
| ***remoteUE-Indication***  This field indicates whether the target device in NR access is configured as a L2 U2N Remote UE. |

*Next change*

6.5.10.8 NR DL-TDOA Error Elements

[…]

– *NR-DL-TDOA-TargetDeviceErrorCauses*

The IE *NR-DL-TDOA-TargetDeviceErrorCauses* is used by the target device to provide NR DL-TDOA error reasons to the location server.

-- ASN1START

NR-DL-TDOA-TargetDeviceErrorCauses-r16 ::= SEQUENCE {

cause-r16 ENUMERATED { undefined,

assistance-data-missing,

unableToMeasureAnyTRP,

attemptedButUnableToMeasureSomeNeighbourTRPs,

thereWereNotEnoughSignalsReceivedForUeBasedDL-TDOA,

locationCalculationAssistanceDataMissing,

...

},

...,

[[

remoteUE-Indication-r18 ENUMERATED {true} OPTIONAL -- Cond NR

]]

}

-- ASN1STOP

| **Conditional presence** | **Explanation** |
| --- | --- |
| *NR* | This field is optionally present, need OR, for NR access. Otherwise it is not present. |

| ***NR-DL-TDOA-TargetDeviceErrorCauses* field descriptions** |
| --- |
| ***remoteUE-Indication***  This field indicates whether the target device in NR access is configured as a L2 U2N Remote UE. |

*Next change*

6.5.11.8 NR DL-AoD Error Elements

[…]

– *NR-DL-AoD-TargetDeviceErrorCauses*

The IE *NR-DL-AoD-TargetDeviceErrorCauses* is used by the target device to provide NR DL-AoD error reasons to the location server.

-- ASN1START

NR-DL-AoD-TargetDeviceErrorCauses-r16 ::= SEQUENCE {

cause-r16 ENUMERATED { undefined,

assistance-data-missing,

unableToMeasureAnyTRP,

attemptedButUnableToMeasureSomeNeighbourTRPs,

thereWereNotEnoughSignalsReceivedForUeBasedDL-AoD,

locationCalculationAssistanceDataMissing,

...

},

...,

[[

remoteUE-Indication-r18 ENUMERATED {true} OPTIONAL -- Cond NR

]]

}

-- ASN1STOP

| **Conditional presence** | **Explanation** |
| --- | --- |
| *NR* | This field is optionally present, need OR, for NR access. Otherwise it is not present. |

| ***NR-DL-TDOA-TargetDeviceErrorCauses* field descriptions** |
| --- |
| ***remoteUE-Indication***  This field indicates whether the target device in NR access is configured as a L2 U2N Remote UE. |

*Next change*

6.5.12.8 NR Multi-RTT Error Elements

[…]

– *NR-Multi-RTT-TargetDeviceErrorCauses*

The IE *NR-Multi-RTT-TargetDeviceErrorCauses* is used by the target device to provide NR Multi-RTT error reasons to the location server.

-- ASN1START

NR-Multi-RTT-TargetDeviceErrorCauses-r16 ::= SEQUENCE {

cause-r16 ENUMERATED { undefined,

dl-assistance-data-missing,

unableToMeasureAnyTRP,

attemptedButUnableToMeasureSomeNeighbourTRPs,

ul-srs-configuration-missing,

unableToTransmit-ul-srs,

...

},

...,

[[

remoteUE-Indication-r18 ENUMERATED {true} OPTIONAL -- Cond NR

]]

}

-- ASN1STOP

| **Conditional presence** | **Explanation** |
| --- | --- |
| *NR* | This field is optionally present, need OR, for NR access. Otherwise it is not present. |

| ***NR-DL-TDOA-TargetDeviceErrorCauses* field descriptions** |
| --- |
| ***remoteUE-Indication***  This field indicates whether the target device in NR access is configured as a L2 U2N Remote UE. |

*End of change*