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LTE;
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conformance specification for UE positioning;
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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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Introduction

The present document is part 2 of a multi-part TS:

3GPP TS 37.571-1: User Equipment (UE) conformance specification for UE positioning; Part 1: Conformance test specification.

3GPP TS 37.571-2: User Equipment (UE) conformance specification for UE positioning; Part 2: Protocol conformance.

3GPP TS 37.571-3: User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS).

3GPP TS 37.571-4: User Equipment (UE) conformance specification for UE positioning; Part 4: Test suites.

3GPP TS 37.571-5: User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data.

1 Scope

The present document specifies the protocol conformance testing for UTRAN, E-UTRAN and NR User Equipment (UE) supporting UE positioning.

This is the second part of a multi-part test specification. The following information can be found in this part:

- the overall protocol conformance test structure;
- the protocol conformance test configurations;
- the conformance requirement and reference to the core specifications;
- the test purposes; and
- a brief description of the test procedure, the specific test requirements and short message exchange table.

The Implementation Conformance Statement (ICS) pro-forma could be found in the 3rd part of the present document.

The present document is valid for UE supporting UE positioning implemented according to 3GPP releases starting from Release 99 up to the Release indicated on the cover page of the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document unless the context in which the reference is made suggests a different Release is relevant (information on the applicable release in a particular context can be found in e.g. test case title, description or applicability, message description or content).

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS) ".

[3] 3GPP TS 36.305: "Stage 2 functional specification of User Equipment (UE) positioning in E-UTRAN".

[4] 3GPP TS 36.355: "LTE Positioning Protocol (LPP)".

[5] 3GPP TS 24.171: "Control Plane Location Services (LCS) procedures in the Evolved Packet System (EPS)".

[6] 3GPP TS 24.030: "Location Services (LCS); Supplementary service operations; Stage 3".

[7] 3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification; Formats and coding".

[8] 3GPP TS 36.508: "Common test environments for User Equipment (UE)".

[9] 3GPP TS 37.571-1: "User Equipment (UE) conformance specification for UE positioning; Part 1: Conformance test specification".

[10] 3GPP TS 37.571-3: "User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS)".

[11] 3GPP TS 37.571-4: "User Equipment (UE) conformance specification for UE positioning; Part 4: Test suites".

[12] 3GPP TS 37.571-5: "User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data".

[13] 3GPP TS 36.509: "Special conformance testing functions for User Equipment (UE)".

[14] 3GPP TS 34.123-1: "User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".

[15] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[16] 3GPP TS 34.108: "Common Test Environments for User Equipment (UE) Conformance Testing".

[17] 3GPP TS 25.331: "RRC Protocol Specification".

[18] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".

[19] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[20] 3GPP TS 33.102: "3G security; Security architecture".

[21] ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

[22] 3GPP TS 23.171: "Location Services (LCS); Functional description; Stage 2 (UMTS)".

[23] GSM TS 03.71: "Location Services (LCS); Functional description; Stage 2".

[24] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[25] 3GPP TS 23.272: "Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2".

[26] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[27] 3GPP TS 22.101: "Service aspects; Service principles".

[28] OMA-TS-LPPe-V2_0: "LPP Extensions Specification", Open Mobile Alliance.

[29] ATIS-0500027: "Recommendations for Establishing Wide Scale Indoor Location Performance", May 2015.

[30] 3GPP TS 38.508-1: "User Equipment (UE) conformance specification; Part 1: Common test environment".

[31] 3GPP TS 38.305: "NG Radio Access Network (NG-RAN); Stage 2 functional specification of User Equipment (UE) positioning in NG-RAN".

[32] 3GPP TS 37.355: "LTE Positioning Protocol (LPP)".

[33] 3GPP TS 38.331: "NR Radio Resource Control (RRC) protocol specification".

[34] 3GPP TS 38.509: "Special conformance testing functions for User Equipment (UE)".

[35] 3GPP TS 38.355: "NR; Sidelink Positioning Protocol (SLPP); Protocol specification".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1], TS 23.271 [2],

TS 36.305 [3], TS 36.355 [4] , TS 38.305 [31] , TS 37.355 [32] apply.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

BDS	BeiDou Navigation Satellite System
DL	Downlink
DL-AoD	Downlink Angle-of-Departure
DL-PRS	Downlink Positioning Reference Signal
DL-TDOA	Downlink Time Difference Of Arrival
LCS	Location Services
LPP	LTE Positioning Protocol
MBS	Metropolitan Beacon System
MO-LR	Mobile Originated Location Request
Multi-RTT	Multi-Round Trip Time
MT-LR	Mobile Terminated Location Request
NAS	Non-Access-Stratum
NI-LR	Network Induced Location Request
NR	New Radio
NR E-CID	NR Enhanced Cell ID (positioning method)
OTA	Over The Air
RSCP	Reference Signal Carrier Phase
RSCPD	Reference Signal Carrier Phase Difference
RSRP	Reference Signal Received Power
RSRPP	Reference Signal Received Path Power
TBS	Terrestrial Beacon System
TEG	Timing Error Group
UL	Uplink
WLAN	Wireless Local Area Network
UL-SRS	Uplink Sounding Reference Signal

4 Default Conditions for UTRAN

4.1 Default system information

Default system information, as specified in 3GPP TS 34.108 [16] subclause 6.1, is broadcasted for the A-GPS test cases in subclause 6.1. For the A-GNSS test cases in subclause 6.2, the default system information, as specified in 3GPP TS 36.508 [8], is broadcasted. SIB15/SIB15.x are not broadcasted unless otherwise stated in the specific test cases.

4.2 Simulated A-GPS and A-GNSS environment

During A-GPS and A-GNSS tests, where required the SS shall generate satellite signals that are of a sufficient number and strength not to prevent the UE from responding to a positioning request with a valid measurement response. Any assistance data provided during these tests shall be consistent with the satellite signals generated during these tests. Note that some tests require assistance data to be provided even though satellite signals are not required.

It is considered that six satellite signals with the level of the simulated satellites all at -125 dBm ± 6 dB should be suitable, however this does not imply any conformance requirements on the UE.

Suitable GPS and GNSS scenarios together with associated assistance data are defined in TS 37.571-5 [12] subclause 5.1 and 6.1, respectively.

The accuracy of the GPS time-of-week and/or GANSS time-of-day in the provided assistance data shall be within ± 2 seconds relative to the GPS and/or GANSS time in the system simulator. In the case that assistance data is required but satellite signals are not required then this clause does not apply.

During A-GNSS signalling tests where satellite signals are required, the SS shall generate all the UE supported GNSS satellite signals.

4.2.1 A-GNSS sub-test cases

The A-GNSS signalling test cases in subclause 6.2 may include several sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in the Table below. The detailed assistance data depend on the particular sub-test case as defined in subclause 4.4.

Table 4.2.1-1: Sub-Test Case Number Definition for UTRA

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: "A-GPS" includes Modernized GPS if supported by the UE.	

4.3 A-GPS assistance data sets

This subclause defines the assistance data sets supplied by the SS in A-GPS test cases specified in subclause 6.1.

Throughout this subclause, "adequate assistance data" means the assistance data used in test cases where it is expected that a UE supporting A-GPS will be able to perform the requested positioning operation using the supplied assistance data, and "inadequate assistance data" is the assistance data used in test cases that expect that the UE will be unable to perform the requested operation. The values of all the fields in all cases are defined in TS 37.571-5 [12] subclause 5.1.3.

4.3.1 Adequate assistance data for UE-based A-GPS

For UE-based test cases requiring adequate assistance data, the IE "UE positioning GPS assistance data" is spread across two separate MEASUREMENT CONTROL messages, and set as follows:

First MEASUREMENT CONTROL MESSAGE:

- UE positioning GPS assistance data		
- UE positioning GPS reference time		
- GPS week	Set according to 4.2	
- GPS Week Cycle Number	Set according to 4.2	Rel-10 UE or later
- GPS TOW msec	Set according to 4.2	
- UTRAN GPS reference time	Not present	
- UE Positioning GPS Reference Time Uncertainty	Set according to 4.2	Rel-7 UE or later
- SFN-TOW uncertainty	Not present	
- $T_{UTRAN-GPS}$ drift rate	Not present	
- GPS TOW assist	Not present	
- UE positioning GPS reference UE position	Set according to 4.2	
- UE positioning GPS DGPS corrections	Not present	
- UE positioning GPS navigation model		
- Satellite information	For satellites 1-3	
- SatID	Set according to 4.2	
- Satellite status	NS NN	
- GPS ephemeris and clock corr. param.	Set according to 4.2	
- UE positioning GPS ionospheric model	Set according to 4.2	
- UE positioning GPS UTC model	Not present	
- UE positioning GPS almanac	Not present	
- UE positioning GPS acquisition assistance	Not present	
- UE positioning GPS real-time integrity	Not present	

Second MEASUREMENT CONTROL message:

- UE positioning GPS assistance data	
- UE positioning GPS reference time	Not present
- UE positioning GPS reference UE position	Not present
- UE positioning GPS DGPS corrections	Not present
- UE positioning GPS navigation model	
- Satellite information	For satellites 4-6
- SatID	Set according to 4.2
- Satellite status	NS NN
- GPS ephemeris and clock corr. param.	Set according to 4.2
- UE positioning GPS ionospheric model	Not present
- UE positioning GPS UTC model	Not present
- UE positioning GPS almanac	Not present
- UE positioning GPS acquisition assistance	Not present
- UE positioning GPS real-time integrity	Not present

4.3.2 Inadequate assistance data for UE-based A-GPS

For UE-based test cases requiring inadequate assistance data, the IE "UE positioning GPS assistance data" is set to "Not present" in the MEASUREMENT CONTROL message.

4.3.3 Adequate assistance data for UE-assisted A-GPS

For UE-assisted test cases requiring adequate assistance data, the IE "UE positioning GPS assistance data" is set as follows for the first MEASUREMENT CONTROL message:

- UE positioning GPS assistance data		
- UE positioning GPS reference time		
- GPS week	Set according to 4.2	
- GPS Week Cycle Number	Set according to 4.2	Rel-10 UE or later
- GPS TOW msec	Set according to 4.2	
- UTRAN GPS reference time	Not present	
- UE Positioning GPS Reference Time Uncertainty	Set according to 4.2	Rel-7 UE or later
- SFN-TOW uncertainty	Not present	
- $T_{UTRAN-GPS}$ drift rate	Not present	
- GPS TOW assist	Not present	
- UE positioning GPS reference UE position	Not present	
- UE positioning GPS DGPS corrections	Not present	
- UE positioning GPS navigation model	Not present	
- UE positioning GPS ionospheric model	Not present	
- UE positioning GPS UTC model	Not present	
- UE positioning GPS almanac	Not present	
- UE positioning GPS acquisition assistance		
- GPS TOW msec	Set according to 4.2	
- UTRAN GPS reference time	Not present	
- UE Positioning GPS Reference Time Uncertainty	Set according to 4.2	Rel-7 UE or later
- Satellite information	Set according to 4.2	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	Rel-10 UE or later
- UE positioning GPS real-time integrity	Not present	

If the UE requests further assistance data, the SS sends subsequent MEASUREMENT CONTROL messages containing the assistance data fields requested by the UE that are available in the SS as specified in TS 37.571-5 [12] subclause 5.1.3 and in subclause 4.3.5.

4.3.4 Inadequate assistance data for UE-assisted A-GPS

For UE-assisted test cases requiring inadequate assistance data, the IE "UE positioning GPS assistance data" is set to "Not present" in the MEASUREMENT CONTROL message.

4.3.5 Response to assistance data requests from UE

If the SS needs to send assistance data in response to a request for additional assistance data from the UE, or in response to an MO-LR request for assistance data, the IE "UE positioning GPS assistance data" is set as follows:

- UE positioning GPS assistance data		
- UE positioning GPS reference time	Set according to 4.2 if requested by the UE	
- GPS week	Set according to 4.2	
- GPS Week Cycle Number	Set according to 4.2	Rel-10 UE or later
- GPS TOW msec	Set according to 4.2	
- UTRAN GPS reference time	Not present	
- UE Positioning GPS Reference Time Uncertainty	Set according to 4.2	Rel-7 UE or later
- SFN-TOW uncertainty	Not present	
- $T_{UTRAN-GPS}$ drift rate	Not present	
- GPS TOW assist	Not present	
- UE positioning GPS reference UE position	Set according to 4.2 if requested by the UE	
- UE positioning GPS DGPS corrections	Not sent	
- UE positioning GPS navigation model	Set according to 4.2 if requested by the UE	
- Satellite information	For satellites 1-6	
- SatID	Set according to 4.2	
- Satellite status	NS NN	
- GPS ephemeris and clock corr. param.	Set according to 4.2	
- UE positioning GPS ionospheric model	Set according to 4.2 if requested by the UE	
- UE positioning GPS UTC model	Not sent	
- UE positioning GPS almanac	Set according to 4.2 if requested by the UE	
- WNa	Set according to 4.2	
- Complete Almanac Provided	True	Rel-10 UE or later
- Satellite information	Set according to 4.2	
- SV Global Health	Not present	
- UE positioning GPS acquisition assistance	Set according to 4.2 if requested by the UE	
- GPS TOW msec	Set according to 4.2	
- UTRAN GPS reference time	Not present	
- UE Positioning GPS Reference Time Uncertainty	Set according to 4.2	Rel-7 UE or later
- Satellite information	Set according to 4.2	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	Rel-10 UE or later
- UE positioning GPS real-time integrity	Not sent	

If the UE requests the GPS navigation model then the SS provides navigation model satellite information for at most three satellites in any one MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY message; additional satellites are sent in subsequent MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY messages.

If the UE requests the GPS almanac then the SS provides almanac information spread across at least two MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY messages.

If the UE requests both GPS navigation model and almanac then the SS provides them in different MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY messages.

4.4 A-GNSS assistance data sets

This subclause defines the assistance data sets supplied by the SS in A-GNSS test cases specified in subclause 6.2. For A-GNSS sub-test cases which include the GPS L1 C/A signal, the A-GPS assistance data as defined in clause 4.3 apply.

Throughout this subclause, "adequate assistance data" means the assistance data used in test cases where it is expected that a UE supporting A-GNSS will be able to perform the requested positioning operation using the supplied assistance data, and "inadequate assistance data" is the assistance data used in test cases that expect that the UE will be unable to perform the requested operation. The values of all the fields in all cases are defined in 3GPP TS 37.571-5 [12] subclause 6.1.3.

4.4.1 Adequate assistance data for UE-based A-GNSS

For UE-based GNSS test cases requiring adequate assistance data, the IE "UE positioning GANSS assistance data" is spread across one or more (dependent on the sub-test) separate MEASUREMENT CONTROL messages, and set as follows:

4.4.1.1 Sub-Test 1

First MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time		
- GANSS Day	Set according to 4.2	
- GANSS Day Cycle Number	Set according to 4.2	Rel-10 UE or later
- GANSS TOD	Set according to 4.2	
- GANSS TOD Uncertainty	Set according to 4.2	
- GANSS Time ID	2 (GLONASS)	
- UTRAN GANSS reference time	Not present	
- $T_{UTRAN-GANSS}$ drift rate	Not present	
- UE positioning GANSS reference UE position	Set according to 4.2	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	3 (GLONASS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Set according to 4.2	
- Non-Broadcast Indication	Not present	
- Satellite information	For satellites 1-6	
- GANSS additional clock models	Model-4	
- GANSS additional orbit models	Model-4	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Not present	
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Set according to 4.2	
- GANSS-ID-3		
- Aux Info List	For satellites 1-6	

4.4.1.2 Sub-Test 2

First MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time		
- GANSS Day	Set according to 4.2	
- GANSS Day Cycle Number	Set according to 4.2	Rel-10 UE or later
- GANSS TOD	Set according to 4.2	
- GANSS TOD Uncertainty	Set according to 4.2	
- GANSS Time ID	Not present	
- UTRAN GANSS reference time	Not present	
- $T_{UTRAN-GANSS}$ drift rate	Not present	
- UE positioning GANSS reference UE position	Set according to 4.2	
- UE positioning GANSS ionospheric model	Set according to 4.2	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	Not present	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Set according to 4.2	
- Non-Broadcast Indication	Not present	
- Satellite information	For satellites 1-N	
- GANSS clock model	Model-1	
- GANSS orbit model	Model-1	
- UE positioning GANSS additional navigation models	Not present	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Not present	
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Not present	

Second MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	Not present
UE positioning GANSS assistance data	
- UE positioning GANSS reference time	Not present
- UE positioning GANSS reference UE position	Not present
- UE positioning GANSS ionospheric model	Not present
- UE positioning GANSS additional ionospheric Model	Not present
- UE positioning GANSS Earth orientation Parameters	Not present
- GANSS Generic Assistance Data	
- GANSS ID	Not present
- UE positioning GANSS SBAS ID	Not present
- GANSS Time Models	Not present
- UE positioning DGANSS corrections	Not present
- UE positioning GANSS navigation model	Set according to 4.2
- Non-Broadcast Indication	Not present
- Satellite information	For satellites (N+1)-6
- GANSS clock model	Model-1
- GANSS orbit model	Model-1
- UE positioning GANSS additional navigation models	Not present
- UE positioning GANSS real-time integrity	Not present
- UE positioning GANSS data bit assistance	Not present
- UE positioning GANSS reference measurement information	Not present
- UE positioning GANSS almanac	Not present
- UE positioning GANSS UTC model	Not present
- UE positioning GANSS additional UTC models	Not present
- UE positioning GANSS auxiliary information	Not present

4.4.1.3 Sub-Test 3

First MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, First Measurement Control Message
UE positioning GANSS assistance data	
- UE positioning GANSS reference time	Not present
- UE positioning GANSS reference UE position	Not present
- UE positioning GANSS ionospheric model	Not present
- UE positioning GANSS additional ionospheric Model	Not present
- UE positioning GANSS Earth orientation Parameters	Not present
- GANSS Generic Assistance Data	
- GANSS ID	1 (Modernized GPS)
- UE positioning GANSS SBAS ID	Not present
- GANSS Time Models	Not present
- UE positioning DGANSS corrections	Not present
- UE positioning GANSS navigation model	Not present
- UE positioning GANSS additional navigation models	Not present
- UE positioning GANSS real-time integrity	Not present
- UE positioning GANSS data bit assistance	Not present
- UE positioning GANSS reference measurement information	Not present
- UE positioning GANSS almanac	Not present
- UE positioning GANSS UTC model	Not present
- UE positioning GANSS additional UTC models	Not present
- UE positioning GANSS auxiliary information	
- GANSS-ID-1	
- Aux Info List	For satellites 1-3

Second MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, Second Measurement Control Message
UE positioning GANSS assistance data	
- UE positioning GANSS reference time	Not present
- UE positioning GANSS reference UE position	Not present
- UE positioning GANSS ionospheric model	Not present
- UE positioning GANSS additional ionospheric Model	Not present
- UE positioning GANSS Earth orientation Parameters	Not present
- GANSS Generic Assistance Data	
- GANSS ID	1 (Modernized GPS)
- UE positioning GANSS SBAS ID	Not present
- GANSS Time Models	Not present
- UE positioning DGANSS corrections	Not present
- UE positioning GANSS navigation model	Not present
- UE positioning GANSS additional navigation models	Not present
- UE positioning GANSS real-time integrity	Not present
- UE positioning GANSS data bit assistance	Not present
- UE positioning GANSS reference measurement information	Not present
- UE positioning GANSS almanac	Not present
- UE positioning GANSS UTC model	Not present
- UE positioning GANSS additional UTC models	Not present
- UE positioning GANSS auxiliary information	
- GANSS-ID-1	
- Aux Info List	For satellites 4-6

4.4.1.4 Sub-Test 4

First MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, First Measurement Control Message
UE positioning GANSS assistance data	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.1.3, First Measurement Control Message, UE positioning GANSS assistance data.

Second MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, Second Measurement Control Message
- UE positioning GPS UTC model	Set according to 4.2.
UE positioning GANSS assistance data	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.1.3, Second Measurement Control Message, UE positioning GANSS assistance data.

Third MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	3 (GLONASS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Set according to 4.2	
- GANSS Time Model		
- GANSS Time Model Reference Time	Set according to 4.2	
- T_{A0}	Set according to 4.2	
- T_{A1}	Not present	
- T_{A2}	Not present	
- GNSS_TO_ID	0 (GPS)	
- Week Number	Not present	
- Delta_T	Set according to 4.2	Rel-10 UE or later
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Set according to 4.2	
- Non-Broadcast Indication	Not present	
- Satellite information	For satellites 1-6	
- GANSS additional clock models	Model-4	
- GANSS additional orbit models	Model-4	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Not present	
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Set according to 4.2	
- GANSS-ID-3		
- Aux Info List	For satellites 1-6	

4.4.1.4A Sub-Test 8

First MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, First Measurement Control Message
UE positioning GANSS assistance data	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.1.3, First Measurement Control Message, UE positioning GANSS assistance data.

Second MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, Second Measurement Control Message
- UE positioning GPS UTC model	Set according to 4.2.
UE positioning GANSS assistance data	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.1.3, Second Measurement Control Message, UE positioning GANSS assistance data.

Third MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	Not present	(Galileo)
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Set according to 4.2	
- GANSS Time Model		
- GANSS Time Model Reference Time	Set according to 4.2	
- T_{A0}	Set according to 4.2	
- T_{A1}	Not present	
- T_{A2}	Not present	
- GNSS_TO_ID	0 (GPS)	
- Week Number	Not present	
- Delta_T	Set according to 4.2	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Not present	
- Non-Broadcast Indication	Not present	
- Satellite information	For satellites 1-6	
- GANSS additional clock models	Model 1	
- GANSS additional orbit models	Model 1	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Not present	
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Not present	

4.4.1.5 Sub-Test 9

First MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time		
- GANSS Day	Set according to 4.2	
- GANSS Day Cycle Number	Set according to 4.2	
- GANSS TOD	Set according to 4.2	
- GANSS TOD Uncertainty	Set according to 4.2	
- GANSS Time ID	3 (BDS)	
- UTRAN GANSS reference time	Not present	
- $T_{UTRAN-GANSS}$ drift rate	Not present	
- UE positioning GANSS reference UE position	Set according to 4.2	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	4 (BDS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Set according to 4.2	
- Non-Broadcast Indication	Not present	
- Satellite information	For satellites 1-6	
- GANSS additional clock models	Model 6	
- GANSS additional orbit models	Model 6	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Not present	
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Not present	

4.4.1.6 Sub-Test 10

First MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, First Measurement Control Message
UE positioning GANSS assistance data	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.1.3, First Measurement Control Message, UE positioning GANSS assistance data.

Second MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.1, Second Measurement Control Message
- UE positioning GPS UTC model	Set according to 4.2.
UE positioning GANSS assistance data	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.1.3, Second Measurement Control Message, UE positioning GANSS assistance data.

Third MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	4 (BDS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Set according to 4.2	
- GANSS Time Model		
- GANSS Time Model Reference Time	Set according to 4.2	
- T_{A0}	Set according to 4.2	
- T_{A1}	Not present	
- T_{A2}	Not present	
- GNSS_TO_ID	0 (GPS)	
- Week Number	Not present	
- Delta_T	Set according to 4.2	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Set according to 4.2	
- Non-Broadcast Indication	Not present	
- Satellite information	For satellites 1-6	
- GANSS additional clock models	Model 6	
- GANSS additional orbit models	Model 6	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Not present	
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Not present	

4.4.2 Inadequate assistance data for UE-based A-GNSS

For UE-based test cases requiring inadequate assistance data, the IE "UE positioning GPS assistance data" and "UE positioning GANSS assistance data" is set to "Not present" in the MEASUREMENT CONTROL message.

4.4.3 Adequate assistance data for UE-assisted A-GNSS

For UE-assisted test cases requiring adequate assistance data, the IEs "UE positioning GPS assistance data" and "UE positioning GANSS assistance data" are set as follows:

4.4.3.1 Sub-Test 1

MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time		
- GANSS Day	Set according to 4.2	
- GANSS Day Cycle Number	Set according to 4.2	Rel-10 UE or later
- GANSS TOD	Set according to 4.2	
- GANSS TOD Uncertainty	Set according to 4.2	
- GANSS Time ID	2 (GLONASS)	
- UTRAN GANSS reference time	Not present	
- $T_{UTRAN-GANSS}$ drift rate	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	3 (GLONASS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Not present	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Set according to 4.2	
- GANSS Signal ID	Not present	
- Satellite Information	For satellites 1-6	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	Rel-10 UE or later
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Set according to 4.2	
- GANSS-ID-3		
- Aux Info List	For satellites 1-6	

4.4.3.2 Sub-Test 2

MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time		
- GANSS Day	Set according to 4.2	
- GANSS Day Cycle Number	Set according to 4.2	Rel-10 UE or later
- GANSS TOD	Set according to 4.2	
- GANSS TOD Uncertainty	Set according to 4.2	
- GANSS Time ID	Not present	
- UTRAN GANSS reference time	Not present	
- $T_{UTRAN-GANSS}$ drift rate	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	Not present	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Not present	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Set according to 4.2	
- GANSS Signal ID	Not present	
- Satellite Information	For satellites 1-6	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	Rel-10 UE or later
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Not present	

4.4.3.3 Sub-Test 3

MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark
UE positioning GPS assistance data	As defined in 4.3.3
UE positioning GANSS assistance data	
- UE positioning GANSS reference time	Not present
- UE positioning GANSS reference UE position	Not present
- UE positioning GANSS ionospheric model	Not present
- UE positioning GANSS additional ionospheric Model	Not present
- UE positioning GANSS Earth orientation Parameters	Not present
- GANSS Generic Assistance Data	
- GANSS ID	1 (Modernized GPS)
- UE positioning GANSS SBAS ID	Not present
- GANSS Time Models	Not present
- UE positioning DGANSS corrections	Not present
- UE positioning GANSS navigation model	Not present
- UE positioning GANSS additional navigation models	Not present
- UE positioning GANSS real-time integrity	Not present
- UE positioning GANSS data bit assistance	Not present
- UE positioning GANSS reference measurement information	Not present
- UE positioning GANSS almanac	Not present
- UE positioning GANSS UTC model	Not present
- UE positioning GANSS additional UTC models	Not present
- UE positioning GANSS auxiliary information	Set according to 4.2
- GANSS-ID-1	
- Aux Info List	For satellites 1-6

4.4.3.4 Sub-Test 4

MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	Comment
UE positioning GPS assistance data	As defined in 4.3.3	
- UE positioning GPS UTC model	Set according to 4.2	
UE positioning GANSS assistance data (1)	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.3.3, Measurement Control Message, UE positioning GANSS assistance data.	
UE positioning GANSS assistance data (2)		If UE positioning GANSS assistance data (1) is present, then UE positioning GANSS assistance data (2) is sent in a second MEASUREMENT CONTROL MESSAGE
- UE positioning GANSS reference time	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	3 (GLONASS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Not present	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information		
- GANSS Signal ID	Not present	
- Satellite Information	For satellites 1-6	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	Rel-10 UE or later
- UE positioning GANSS auxiliary information	Set according to 4.2	
- GANSS-ID-3		
- Aux Info List	For satellites 1-6	

4.4.3.4A Sub-Test 8

MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	Comment
UE positioning GPS assistance data	As defined in 4.3.3	
- UE positioning GPS UTC model	Set according to 4.2	
UE positioning GANSS assistance data (1)	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.3.3, Measurement Control Message, UE positioning GANSS assistance data.	
UE positioning GANSS assistance data (2)		If UE positioning GANSS assistance data (1) is present, then UE positioning GANSS assistance data (2) is sent in a second MEASUREMENT CONTROL MESSAGE
- UE positioning GANSS reference time	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	Not present	(Galileo)
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Not present	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information		
- GANSS Signal ID	Not present	
- Satellite Information	For satellites 1-6	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	
- UE positioning GANSS auxiliary information	Not present	

4.4.3.5 Sub-Test 9

MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	
UE positioning GPS assistance data	Not present	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time		
- GANSS Day	Set according to 4.2	
- GANSS Day Cycle Number	Set according to 4.2	
- GANSS TOD	Set according to 4.2	
- GANSS TOD Uncertainty	Set according to 4.2	
- GANSS Time ID	3 (BDS)	
- UTRAN GANSS reference time	Not present	
- $T_{UTRAN-GANSS}$ drift rate	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	4 (BDS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Not present	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Set according to 4.2	
- GANSS Signal ID	Not present	
- Satellite Information	For satellites 1-6	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	
- UE positioning GANSS almanac	Not present	
- UE positioning GANSS UTC model	Not present	
- UE positioning GANSS additional UTC models	Not present	
- UE positioning GANSS auxiliary information	Not present	

4.4.3.6 Sub-Test 10

MEASUREMENT CONTROL MESSAGE:

Information Element	Value/Remark	Comment
UE positioning GPS assistance data	As defined in 4.3.3	
- UE positioning GPS UTC model	Set according to 4.2	
UE positioning GANSS assistance data (1)	If for GPS only L1 C/A supported, not present. If multiple GPS signals supported, as defined in 4.4.3.3, Measurement Control Message, UE positioning GANSS assistance data.	
UE positioning GANSS assistance data (2)		If UE positioning GANSS assistance data (1) is present, then UE positioning GANSS assistance data (2) is sent in a second MEASUREMENT CONTROL MESSAGE
- UE positioning GANSS reference time	Not present	
- UE positioning GANSS reference UE position	Not present	
- UE positioning GANSS ionospheric model	Not present	
- UE positioning GANSS additional ionospheric Model	Not present	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	4 (BDS)	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Not present	
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Not present	
- UE positioning GANSS additional navigation models	Not present	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information		
- GANSS Signal ID	Not present	
- Satellite Information	For satellites 1-6	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	
- UE positioning GANSS auxiliary information	Not present	

If the UE requests further assistance data, the SS sends subsequent MEASUREMENT CONTROL messages containing the assistance data fields requested by the UE that are available in the SS as specified in TS 37.571-5 [12] subclause 6.1.3 and in clause 4.4.5.

4.4.4 Inadequate assistance data for UE-assisted A-GNSS

For UE-assisted test cases requiring inadequate assistance data, the IEs "UE positioning GPS assistance data" and "UE positioning GANSS assistance data" are set to "Not present" in the MEASUREMENT CONTROL message.

4.4.5 Response to assistance data requests from UE

If the SS needs to send assistance data in response to a request for additional assistance data from the UE, or in response to an MO-LR request for assistance data, the IEs "UE positioning GPS assistance data" and "UE positioning GANSS assistance data" are set as follows:

Information Element	Value/Remark	
UE positioning GPS assistance data	Set according to 4.3.5	
- UE positioning GPS UTC model	Set according to 4.2	
UE positioning GANSS assistance data		
- UE positioning GANSS reference time	Set according to 4.2	
- GANSS Day	Set according to 4.2	
- GANSS Day Cycle Number	Set according to 4.2	Rel-10 UE or later
- GANSS TOD	Set according to 4.2	
- GANSS TOD Uncertainty	Set according to 4.2	
- GANSS Time ID	Set according to 4.2	
- UTRAN GANSS reference time	Not present	
- $T_{UTRAN-GANSS}$ drift rate	Not present	
- UE positioning GANSS reference UE position	Set according to 4.2	
- UE positioning GANSS ionospheric model	Set according to 4.2	
- UE positioning GANSS additional ionospheric Model	Set according to 4.2	
- UE positioning GANSS Earth orientation Parameters	Not present	
- GANSS Generic Assistance Data		
- GANSS ID	Set according to 4.2	
- UE positioning GANSS SBAS ID	Not present	
- GANSS Time Models	Set according to 4.2	
- GANSS Time Model	Set according to 4.2	
- GANSS Time Model Reference Time	Set according to 4.2	
- T_{A0}	Set according to 4.2	
- T_{A1}	Not present	
- T_{A2}	Not present	
- GNSS_TO_ID	Set according to 4.2	
- Week Number	Not present	
- Delta_T	Set according to 4.2	Rel-10 UE or later
- UE positioning DGANSS corrections	Not present	
- UE positioning GANSS navigation model	Set according to 4.2	
- UE positioning GANSS additional navigation models	Set according to 4.2	
- UE positioning GANSS real-time integrity	Not present	
- UE positioning GANSS data bit assistance	Not present	
- UE positioning GANSS reference measurement information	Set according to 4.2	
- GANSS Signal ID	Set according to 4.2	
- Satellite Information	Set according to 4.2	
- Extra Doppler	Set according to 4.2	
- Azimuth and Elevation	Set according to 4.2	
- Azimuth and Elevation LSB	Set according to 4.2	Rel-10 UE or later
- UE positioning GANSS almanac	Set according to 4.2	
- Complete Almanac Provided	True	Rel-10 UE or later
- UE positioning GANSS UTC model	Set according to 4.2	
- UE positioning GANSS additional UTC models	Set according to 4.2	
- UE positioning GANSS auxiliary information	Set according to 4.2	

If the UE requests the GPS navigation model or the GANSS navigation model Model-1, Model-2, Model-3 or Model 6 then the SS provides navigation model satellite information for at most three satellites in any one MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY message; additional satellites are sent in subsequent MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY messages.

If the UE requests the GPS or GANSS almanac then the SS provides almanac information spread across at least two MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY messages.

If the UE requests both navigation model and almanac then the SS provides them in different MEASUREMENT CONTROL or ASSISTANCE DATA DELIVERY messages.

5 Default Conditions for E-UTRAN

5.1 LCS Sub-Test Cases

Some test cases defined in clause 7 may include several sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a sub-test case number as defined in Table 5.1-1. The applicable sub-tests for each test case are specified in the test procedure sequence clause of each test case. If no sub-tests are defined for a specific test case it means that this particular test case is not dependent on a specific positioning method.

Table 5.1-1: Sub-Test Case Numbers for E-UTRA

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
5	UE supporting OTDOA
6 FDD	UE supporting ECID (FDD)
6 TDD	UE supporting ECID (TDD)
7	UE supporting GNSS(1) and OTDOA
8	Void
9	Void
10	Void
11	UE supporting WLAN (Rel-13 only)
12	UE supporting MBS(2) (Rel-13 only)
13	UE supporting Bluetooth
14	UE supporting Sensor (Rel-13 only)
15	UE supporting GNSS(1)
16	UE supporting MBS(2) (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
23	UE supporting MBS(2) (Rel-15 onwards)
24	UE supporting Sensor (Rel-15 onwards)
25	UE supporting GNSS(1) (Rel-15 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE NOTE 2: Metropolitan Beacon System (MBS) is a specific type of Terrestrial Beacon System (TBS) [29]	

5.2 Default signal conditions

5.2.1 Simulated GNSS environment

During A-GNSS signalling tests, where required the SS shall generate all UE supported satellite signals. Where required the SS shall provide assistance data dependent on UE capabilities defined in subclause 5.4.1.1 and consistent with the satellite signals generated during these tests if satellite signals are also required.

The levels of the simulated satellites shall be at -125 dBm ± 6 dBm.

GNSS scenarios together with associated assistance data are defined in TS 37.571-5 [12].

The accuracy of the GNSS time in the provided assistance data shall be within ± 2 seconds relative to the GNSS time in the system simulator. In the case that assistance data is required but satellite signals are not required then this clause does not apply.

5.2.2 Simulated OTDOA environment

For OTDOA signalling test cases a multi cell environment with Cell 1 and Cell 2 (where required) is used, as defined in 3GPP TS 36.508 [8].

All cells transmit PRS according to the PRS configuration provided in the OTDOA assistance data defined in subclause 5.4.1.2. The positioning subframes are low-interference subframes, i.e. contain no PDSCH transmissions.

Normal propagation condition is used for all cells. Cell 1 is the serving cell and Cell 2 (where required) is a neighbour cell.

Where two cells are required, the two Cells 1 and 2 shall be synchronized, and the timing offset (the RSTD) between the cells, referenced to the UE's antenna input, shall be set equal to the *expectedRSTD* value provided in the OTDOA assistance data, as defined in subclause 5.4.1.2.

The E-UTRA frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

5.2.3 Simulated ECID environment

For ECID signalling test cases a multi cell environment with Cell 1 and Cell 2 is used, as defined in 3GPP TS 36.508 [8].

Normal propagation condition is used for all cells. Cell 1 is the serving cell and Cell 2 is a neighbour cell.

The E-UTRA frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

NOTE: If the only ECID measurement supported by the UE is the UE Rx-Tx Time Difference Measurement, Cell 2 does not need to be simulated (see also table 5.4-6).

5.2.4 Simulated MBS environment

During MBS signalling tests, where required, the SS shall generate the UE supported MBS signals as defined in the MBS scenarios defined in TS 37.571-5 [12].

5.2.5 Simulated WLAN environment

During WLAN signalling tests, where required, the SS shall generate the UE supported WLAN signals as defined in the WLAN scenarios defined in TS 37.571-5 [12].

5.2.6 Simulated Bluetooth environment

During Bluetooth signalling tests, where required, the SS shall generate the UE supported Bluetooth signals as defined in the Bluetooth scenarios defined in TS 37.571-5 [12].

5.2.7 Simulated Sensor environment

During Sensor signalling tests there is no simulated sensor environment.

5.3 Default RRC and NAS message and information elements contents

The default values of common RRC and NAS messages and information elements are used as defined in 3GPP TS 36.508 [8] with the following exceptions.

- ATTACH ACCEPT

Table 5.3-1: ATTACH ACCEPT

Derivation Path: 36.508 Table 4.7.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
EPS network feature support	Set according to Table 5.3-2		

Table 5.3-2: EPS network feature support

Derivation Path: 24.301 clause 9.9.3.12A			
Information Element	**Value/remark**	**Comment**	**Condition**
IMS voice over PS session indicator (IMS VoPS) (octet 3, bit 1)	1	IMS voice over PS session in S1 mode supported	
Emergency bearer services indicator (EMC BS) (octet 3, bit 2)	1	emergency bearer services in S1 mode supported	
Location services indicator in EPC (EPC-LCS) (octet 3, bit 3)	1	location services via EPC supported	
Location services indicator in CS (CS-LCS) (octet 3, bit 4 to 5)	01	location services via CS domain not supported	
octet 3, bit 6 to 8	000	spare	

5.4 Default LPP message and information elements contents

This clause contains the default values of LPP messages and information elements used, unless indicated otherwise in specific clauses of this specification.

- LPP REQUEST CAPABILITIES

Table 5.4-1: RequestCapabilities

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
Initiator	locationServer		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestCapabilities-r9 SEQUENCE {			
commonIEsRequestCapabilities SEQUENCE {	Present	Rel-14 onwards	
lpp-message-segmentation-req-r14	00	Server is not able to send segmented LPP messages. Server is not able to receive segmented LPP messages. Rel-14 onwards	
}			
a-gnss-RequestCapabilities SEQUENCE {			
gnss-SupportListReq	TRUE		
assistanceDataSupportListReq	TRUE		
locationVelocityTypesReq	TRUE		
}			
otdoa-RequestCapabilities SEQUENCE {	Present		
}			
ecid-RequestCapabilities SEQUENCE {	Present		
}			
epdu-RequestCapabilities	Not present		
sensor-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
tbs-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
wlan-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
bt-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

- LPP PROVIDE ASSISTANCE DATA

Table 5.4-2: ProvideAssistanceData

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {	Dependent on test case.		
initiator			
transactionNumber			
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
commonIEsProvideAssistanceData	Not present		
a-gnss-ProvideAssistanceData SEQUENCE {			Sub-tests 7 and 15 only; and as defined in Table 5.4.1.1-1.
gnss-CommonAssistData SEQUENCE {			
gnss-ReferenceTime	As defined in 37.571-5 [12]		
gnss-ReferenceLocation	As defined in 37.571-5 [12]		
gnss-IonosphericModel	As defined in 37.571-5 [12]		
gnss-EarthOrientationParameters	Not present		
}			
gnss-GenericAssistData(SIZE(1..4))OF{	SIZE is dependent on the number of GNSSs supported by the UE. If one GNSS supported by the UE, SIZE = 1 If two GNSSs supported by the UE, SIZE = 2 If three GNSSs supported by the UE, SIZE = 3 If four GNSSs supported by the UE, SIZE = 4		
gnss-ID	For each GNSS supported by the UE.		
sbas-ID	Not present		
gnss-TimeModels	As defined in 37.571-5 [12]		
gnss-DifferentialCorrections	Not present		
gnss-NavigationModel	As defined in 37.571-5 [12]		
gnss-RealTimeIntegrity	Not present		
gnss-DataBitAssistance	Not present		
gnss-AcquisitionAssistance	As defined in 37.571-5 [12]		
gnss-Almanac	As defined in 37.571-5 [12]		
gnss-UTC-Model	As defined in 37.571-5 [12]		
gnss-AuxiliaryInformation	As defined in 37.571-5 [12]		
}			
gnss-Error	Not present		
}			
otdoa-ProvideAssistanceData SEQUENCE {			Sub-test 5 and 7 only

otdoa-ReferenceCellInfo	As defined in Table 5.4.1.2-1		
otdoa-NeighbourCellInfo	As defined in Table 5.4.1.2-2		
otdoa-Error	Not present		
}			
epdu-Provide-AssistanceData	Not present		
sensor-ProvideAssistanceData-r14 SEQUENCE {		Rel-14 onwards	Sub-test 18 only as defined in clause 5.4.1.5
sensor-AssistanceDataList-r14	As defined in Table 5.4.1.5-2		
sensor-Error-r14	Not present		
}			
tbs-ProvideAssistanceData-r14 SEQUENCE {		Rel-14 onwards	Sub-test 16 only as defined in clause 5.4.1.3
tbs-AssistanceDataList-r14 SEQUENCE {			
mbs-AssistanceDataList-r14 SEQUENCE (SIZE(1..n)) OF SEQUENCE{			
mbs-AlmanacAssistance-r14	As defined in Table 5.4.1.3-2		
mbs-AcquisitonAssistance-r14	As defined in Table 5.4.1.3-2		
}			
}			
tbs-Error-r14	Not present		
}			
wlan-ProvideAssistanceData-r14 SEQUENCE {		Rel-14 onwards	Sub-test 17 only as defined in clause 5.4.1.4
wlan-DataSet-r14	As defined in Table 5.4.1.4-2		
wlan-Error-r14	Not present		
}			
}			
}			
}			
}			
}			
}			

- LPP REQUEST LOCATION INFORMATION

Table 5.4-3: RequestLocationInformation

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestLocationInformation-r9 SEQUENCE {			
commonIEsRequestLocationInformation SEQUENCE {			
locationInformationType	Dependent on test case		
triggeredReporting	Not present		
periodicalReporting	Not present		
additionalInformation	onlyReturnInformationRequested		
qos SEQUENCE {			
horizontalAccuracy	Not present		
verticalCoordinateRequest	FALSE		
verticalAccuracy	Not present		
responseTime SEQUENCE {			
time	32		
responseTimeEarlyFix-r12	Not present	Rel-12 onwards	
}			
velocityRequest	FALSE		
}			
environment	Not present		
locationCoordinateTypes	Not present		
velocityTypes	Not present		
}			
a-gnss-RequestLocationInformation	As defined in Table 5.4-4		Sub-tests 7 and 15
otdoa-RequestLocationInformation	As defined in Table 5.4-5		Sub-test 5 and 7
ecid-RequestLocationInformation	As defined in Table 5.4-6		Sub-test 6
epdu-RequestLocationInformation	Not Present		
sensor-RequestLocationInformation-r13	As defined in Table 5.4-10	Rel-13 onwards	Sub-test 14, 18
tbs-RequestLocationInformation-r13	As defined in Table 5.4-7	Rel-13 onwards	Sub-tests 12, 16
wlan-RequestLocationInformation-r13	As defined in Table 5.4-8	Rel-13 onwards	Sub-test 11, 17
bt-RequestLocationInformation-r13	As defined in Table 5.4-9	Rel-13 onwards	Sub-test 13
}			
}			
}			
}			
}			
}			

- A-GNSS REQUEST LOCATION INFORMATION

Table 5.4-4: A-GNSS-RequestLocationInformation

Derivation Path: 36.355 clause 6.5.2.7			
Information Element	**Value/remark**	**Comment**	**Condition**
A-GNSS-RequestLocationInformation ::= SEQUENCE {			
gnss-PositioningInstructions SEQUENCE {			
gnss-Methods	Dependent on the GNSS(s) supported by the UE. If GPS supported bit 0 = 1 If Galileo supported bit 3 = 1 If GLONASS supported bit 4 = 1 If BDS supported bit 5 = 1	GNSS-ID-Bitmap	
fineTimeAssistanceMeasReq	FALSE		
adrMeasReq	FALSE		
multiFreqMeasReq	FALSE		
assistanceAvailability	FALSE		
}			
}			

- OTDOA REQUEST LOCATION INFORMATION

Table 5.4-5: OTDOA-RequestLocationInformation

Derivation Path: 36.355 clause 6.5.1.6			
Information Element	**Value/remark**	**Comment**	**Condition**
OTDOA-RequestLocationInformation ::= SEQUENCE {			
assistanceAvailability	FALSE		
multipathRSTD-r14	Not present		Rel-14 onwards
maxNoOfRSTDmeas-r14	Not present		Rel-14 onwards
}			

- ECID REQUEST LOCATION INFORMATION

Table 5.4-6: ECID-RequestLocationInformation

Derivation Path: 36.355 clause 6.5.3.3			
Information Element	**Value/remark**	**Comment**	**Condition**
ECID-RequestLocationInformation ::= SEQUENCE {			
requestedMeasurements	All measurements supported by the UE		
}			

- TBS REQUEST LOCATION INFORMATION

Table 5.4-7: TBS-RequestLocationInformation

Derivation Path: 36.355 clause 6.5.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
TBS-RequestLocationInformation-r13 ::= SEQUENCE {			
mbsSgnMeasListReq-r13	TRUE (UE-Assisted MBS)	Rel-13 onwards	
mbsAssistanceAvailability-r14	FALSE	Rel-14 onwards	
mbsRequestedMeasurements-r14	Not present	Rel-14 onwards	
}			

- WLAN REQUEST LOCATION INFORMATION

Table 5.4-8: WLAN-RequestLocationInformation

Derivation Path: 36.355 clause 6.5.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
WLAN-RequestLocationInformation-r13 ::= SEQUENCE {			
requestedMeasurements-r13	bit 0 = 1 (rssi) (UE-Assisted WLAN) bit 1 = 1 (rtt) (UE-Assisted WLAN)	Rel-13 onwards	
assistanceAvailability-r14	FALSE	Rel-14 onwards	
}			

- BT REQUEST LOCATION INFORMATION

Table 5.4-9: BT-RequestLocationInformation

Derivation Path: 36.355 clause 6.5.7.3			
Information Element	**Value/remark**	**Comment**	**Condition**
BT-RequestLocationInformation-r13 ::= SEQUENCE {			
requestedMeasurements-r13	bit 0 = 1 (rssi) (UE-Assisted BT)	Rel-13 onwards	
}			

- SENSOR REQUEST LOCATION INFORMATION

Table 5.4-10: Sensor-RequestLocationInformation

Derivation Path: 36.355 clause 6.5.5.3			
Information Element	**Value/remark**	**Comment**	**Condition**
Sensor-RequestLocationInformation-r13 ::= SEQUENCE {			
uncompensatedBarometricPressureReq-r13	TRUE (UE-Assisted Sensor)	Rel-13 onwards	
assistanceAvailability-r14	FALSE	Rel-14 onwards	
}			

5.4.1 Default assistance data information elements

5.4.1.1 GNSS Assistance Data Elements

Table 5.4.1.1-1 defines the GNSS assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message. The GNSS

assistance data provided depends on the mode being used in the test case, the assistance data supported by the UE and the GNSSs supported by the UE. GNSS assistance data IEs not supported by the UE shall not be sent. GNSS assistance data IEs supported by the UE but not listed in Table 5.4.1.1-1 shall not be sent. The content of the assistance data elements is defined in 37.571-5 [12] clause 7.

Table 5.4.1.1-1: GNSS assistance data to be provided to the UE

GNSS Assistance Data IE supported by UE	Mode used in test case		
	UE-based	UE-assisted, GNSS-AcquisitionAssistance supported by UE	UE-assisted, GNSS-AcquisitionAssistance not supported by UE
GNSS-Reference Time	Yes	Yes	Yes
GNSS-ReferenceLocation	Yes	No	Yes
GNSS-IonosphericModel	Yes	No	No
GNSS-TimeModelList	Yes(1)	No	Yes(1)
GNSS-NavigationModel	Yes	No	Yes
GNSS-AcquisitionAssistance	No	Yes	No
GNSS-Almanac	No	No	Yes
GNSS-UTC-Model	Yes(3)	Yes(3)	Yes(3)
GNSS-AuxiliaryInformation	Yes(2)	Yes(2)	Yes(2)
NOTE 1: Only if more than one GNSS supported by the UE. NOTE 2: Only if GLONASS supported by the UE, and/or if the UE supports multiple signals per GNSS, and/or if BDS B1C/B2a signal type supported by the UE. NOTE 3: Only if GLONASS and at least one other GNSS supported by the UE.			

5.4.1.2 OTDOA Assistance Data Elements

This subclause defines the OTDOA assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages.

- OTDOA REFERENCE CELL INFO

Table 5.4.1.2-1: OTDOA-ReferenceCellInfo

Derivation Path: 36.355 clause 6.5.1.2			
Information Element	**Value/remark**	**Comment**	**Condition**
OTDOA-ReferenceCellInfo ::= SEQUENCE {		Cell 1	
physCellId	0		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 1 in 36.508 [8]		
mnc	As defined for Cell 1 in 36.508 [8]		
cellidentity	As defined for E-UTRAN Cell Identifier for Cell 1 in 36.508 [8]		
}			
earfcnRef	Not present	Same as the serving cell	
antennaPortConfig	Not present	Same as the serving cell	
cpLength	Normal		
prsInfo SEQUENCE {			
prs-Bandwidth	PRS are transmitted over the used system bandwidth (see subclause 5.2.2)		
prs-ConfigurationIndex	FDD: 2 TDD: 4		
numDL-Frames	sf-1		
prs-MutingInfo-r9	Not present	PRS muting is not used.	
prsID-r14	Not present	PRS-ID not used	Rel-14 onwards
add-numDL-Frames-r14	Not present	Not required	Rel-14 onwards
prsOccGroupLen-r14	Not present	No PRS occasion group configured	Rel-14 onwards
prsHoppingInfo-r14	Not present	PRS frequency hopping not used	Rel-14 onwards
}			
earfcnRef-v9a0	Not present	Same as the serving cell	
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
cpLengthCRS-r14	Normal		Rel-14 onwards
sameMBSFNconfigRef-r14	TRUE	Same as the serving cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as the serving cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigRef-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
}			

- OTDOA NEIGHBOUR CELL INFO LIST

Table 5.4.1.2-2: OTDOA-NeighbourCellInfoList

Derivation Path: 36.355 clause 6.5.1.2			
Information Element	**Value/remark**	**Comment**	**Condition**
OTDOA-NeighbourCellInfoList ::= SEQUENCE (SIZE(1)) OF SEQUENCE {			
SEQUENCE (SIZE(2)) OF SEQUENCE {		Cell 2	
physCellId	2		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 2 in 36.508 [8]		
mnc	As defined for Cell 2 in 36.508 [8]		
cellidentity	As defined for E-UTRAN Cell Identifier for Cell 2 in 36.508 [8]		
}			
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	Not present		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 μs	
earfcn-v9a0	Not present	Same as for the reference cell	
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Not present	Not required	Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
}			
SEQUENCE {		Cell 4	
physCellId	4		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 4 in 36.508 [8]		
mnc	As defined for Cell 4 in 36.508 [8]		
cellidentity	As defined for E-UTRAN Cell Identifier for Cell 4 in 36.508 [8]		
}			
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	
antennaPortConfig	Not present	Same as for the reference cell	

slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	Not present		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 µs	
earfcn-v9a0	Not present	Same as for the reference cell	
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Not present	Not required	Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
}			
}			

5.4.1.3 MBS Assistance Data Elements

Tables 5.4.1.3-1 and 5.4.1.3-2 define the MBS assistance data elements which shall be provided to the UE in sub-test 16 via LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message.

Table 5.4.1.3-1 defines the MBS assistance data IEs that conditionally depend on the mode being used in the test case and on the assistance data supported by the UE.

Table 5.4.1.3-2 defines the content of the TBS-AssistantDataList.

Table 5.4.1.3-1: MBS assistance data IEs to be conditionally provided to the UE

MBS Assistance Data IE supported by UE	Mode used in test case	
	UE-based, MBS (Release 14 onwards)	UE-assisted, MBS (Release 14 onwards)
mbs-AlmanacAssistance-r14	Yes	No
mbs-AcquisitionAssistance-r14	Yes	Yes

Table 5.4.1.3-2: Content of TBS-AssistanceDataList

Derivation Path: TS 36.355 [4] clause 6.5.4			
Information Element	**Value/remark**	**Comment**	**Condition**
tbs-AssistanceDataList-r14 SEQUENCE {			
mbs-AssistanceDataList-r14 SEQUENCE {			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 1 tb1	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 2 tb1	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 3 tb1	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 4 tb1	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 1 tb2	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 2 tb2	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		

mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 3 tb2	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
mbs-AssistanceDataElement-r14 SEQUENCE {		Beacon 4 tb2	
mbs-AlmanacAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
mbs-AcquisitionAssistance-r14	According to Table 5.4.1.3-1 and as defined in TS 37.571-5 [12], clause 8		
}			
}			
}			

5.4.1.4 WLAN Assistance Data Elements

Tables 5.4.1.4-1 and 5.4.1.4-2 define the WLAN assistance data elements which shall be provided to the UE in sub-test 17 via LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message.

Table 5.4.1.4-1 defines the WLAN assistance data IE that conditionally depends on the mode being used in the test case and on the assistance data supported by the UE.

Table 5.4.1.4-2 defines the content of the WLAN-DataSet.

Table 5.4.1.4-1: WLAN assistance data IE to be conditionally provided to the UE

WLAN assistance data IE supported by UE	Mode used in test case	
	UE-based, WLAN (Release 14 onwards)	UE-assisted, WLAN (Release 14 onwards)
wlan-AP-Location-r14 (WLAN AP location information)	Yes	No

Table 5.4.1.4-2: Content of WLAN-DataSet

Derivation Path: TS 36.355 [4] clause 6.5.6.8			
Information Element	**Value/remark**	**Comment**	**Condition**
wlan-DataSet-r14::= SEQUENCE (SIZE (1)) OF SEQUENCE {			Rel-14 onwards
SEQUENCE (SIZE (4)) OF SEQUENCE.{			
WLAN-AP-Data-r14 SEQUENCE {		WLAN AP 1	
wlan-AP-Identifier-r14	As defined in TS 37.571-5 [12], clause 9		
wlan-AP-Location-r14	According to Table 5.4.1.4-1 and as defined in TS 37.571-5 [12], clause 9		
}			
WLAN-AP-Data-r14 SEQUENCE {		WLAN AP 2	
wlan-AP-Identifier-r14	As defined in TS 37.571-5 [12], clause 9		
wlan-AP-Location-r14	According to Table 5.4.1.4-1 and as defined in TS 37.571-5 [12], clause 9		
}			
WLAN-AP-Data-r14 SEQUENCE {		WLAN AP 3	
wlan-AP-Identifier-r14	As defined in TS 37.571-5 [12], clause 9		
wlan-AP-Location-r14	According to Table 5.4.1.4-1 and as defined in TS 37.571-5 [12], clause 9		
}			
WLAN-AP-Data-r14 SEQUENCE {		WLAN AP 4	
wlan-AP-Identifier-r14	As defined in TS 37.571-5 [12], clause 9		
wlan-AP-Location-r14	According to Table 5.4.1.4-1 and as defined in TS 37.571-5 [12], clause 9		
}			
supportedChannels-11a-r14	As defined in TS 37.571-5 [12], clause 9		
supportedChannels-11bg-r14	As defined in TS 37.571-5 [12], clause 9		
}			
}			

5.4.1.5 Sensor Assistance Data Elements

Tables 5.4.1.5-1 and 5.4.1.5-2 define the Sensor assistance data elements which shall be provided to the UE in sub-test 18 via LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message.

Table 5.4.1.5-1 defines the Sensor assistance data IE that conditionally depends on the mode being used in the test case.

Table 5.4.1.5-2 defines the content of the Sensor-AssistanceDataList.

Table 5.4.1.5-1: Sensor assistance data IE to be conditionally provided to the UE

Sensor assistance data to be provided to the UE	**Mode used in test case**	
	UE-based, Sensor (Release 14 onwards)	**UE-assisted, Sensor (Release 14 onwards)**
sensor-AssistanceDataList-r14	Yes	No

Table 5.4.1.5-2: Content of Sensor-AssistanceDataList

Derivation Path: TS 36.355 [4] clause 6.5.5.8			
Information Element	**Value/remark**	**Comment**	**Condition**
Sensor-AssistanceDataList-r14::= SEQUENCE {	According to Table 5.4.1.5-1		Rel-14 onwards
refPressure-r14	0	101325 Pa	
refPosition-r14	As defined in TS 37.571-5 [12], clause 6.1.3.4, GNSS-ReferenceLocation	As used in GNSS sub-tests	
refTemperature-r14	20	293K	
period-v1520	Not present		
area-v1520	Not present		
}			

6 Protocol Conformance Test Cases for UTRAN

6.1 Assisted-GPS Test Cases

6.1.1 Assisted GPS Network Induced Tests

6.1.1.1 LCS Network Induced location request/ UE-Based GPS/ Emergency Call / with USIM

6.1.1.1.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities.

6.1.1.1.2 Conformance requirements

1) A MM connection for an emergency call may be established in all states of the mobility management sublayer which allow MM connection establishment for a normal originating call.

   When a user requests an emergency call establishment the UE will send a CM SERVICE REQUEST message to the network with a CM service type information element indicating emergency call establishment.

2) Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the UE sends a setup message to its peer entity. This setup message is

   - a SETUP message, if the call to be established is a basic call; and
   - an EMERGENCY SETUP message, if the call to be established is an emergency call.

3) If the IE "UE positioning GPS reference time" is included, the UE shall:

   1> store the IE "GPS Week" in "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as the current GPS week;

   1> store the IE "GPS TOW msec" in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as an estimate of the GPS Time-of-Week at the time of reception of the complete message containing the IE "GPS TOW msec";

NOTE: The UE does not need to apply any compensation on the GPS Time-of-Week.

4) If the IE "UE positioning GPS reference UE position" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS reference UE position" in variable UE_POSITIONING_GPS_DATA; and

1> use it as a priori knowledge of the approximate location of the UE.

5) The UE shall when a measurement report is triggered:

2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

4> if the IE "GPS timing of Cell wanted" is set to FALSE:

5> include the IE "GPS TOW msec".

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

Reference(s):

- Conformance requirement 1: TS 24.008 clause 4.5.1.5.
- Conformance requirement 2: TS 24.008, clause 5.2.1.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.3.7.
- Conformance requirement 4: TS 25.331, clause 8.6.7.19.3.8.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.1b.

6.1.1.1.3 Test Purpose

To verify when an emergency call is initiated by a UE with a USIM, and the network performs a location request using the RRC measurement control procedure by sending Measurement Control message , then the UE respond with a Measurement Report containing UE location.

6.1.1.1.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.

- Satellite signals: As specified in 4.2.

- User Equipment:

  - the UE is in state "MM idle" with valid TMSI and CKSN.

Related PICS/PIXIT Statements

- Emergency speech call yes/no

- UE Based Network Assisted GPS

Test procedure

The UE is made to initiate an emergency call.

After the call has been through-connected in both directions, the SS orders an A-GPS positioning measurement using two MEASUREMENT CONTROL messages. The last MEASUREMENT CONTROL message orders periodical reporting by sending a MEASUREMENT CONTROL message requesting periodical measurement reporting (1 report, interval 64s).

The UE then performs positioning measurements, calculates "UE Positioning Position Estimate Info" and responds with this in the RRC message MEASUREMENT REPORT.

Finally the SS clears the call.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	UE			The "emergency number" is entered. Number shall be one programmed in test USIM EF_{ECC} (Emergency Call Codes), ref. 34.108 clause 8.3.2.21.
2	-->			UE establishes RRC procedure for emergency call. Establishment cause: Emergency Call SS checks that the UE capability includes A-GPS UE based positioning measurement
3	-->		CM SERVICE REQUEST	The CM service type IE indicates "emergency call establishment".
4	<--		AUTHENTICATION REQUEST	IE Authentication Parameter AUTN shall be present in the message.
5	-->		AUTHENTICATION RESPONSE	SRES specifies correct value.
6				SS starts security procedure.
7	-->		EMERGENCY SETUP	If the Bearer capability IE is not included the default UMTS AMR speech version shall be assumed.
8	<--		CALL PROCEEDING	
9	<--		ALERTING	
10	<--			SS sets up the radio bearer with the rate indicated by the EMERGENCY SETUP message.
11	<--		CONNECT	
12	-->		CONNECT ACKNOWLEDGE	
13	UE			The DTCH is through connected in both directions.
14	<-		MEASUREMENT CONTROL	
15	<-		MEASUREMENT CONTROL	
16	-->		MEASUREMENT REPORT	
17	<--		DISCONNECT	SS disconnects the call and associated radio bearer.

Specific Message Contents

MEASUREMENT CONTROL (Step 14):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 15):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 16):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	GPS reference time only
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

6.1.1.1.5 Test requirements

After step 12 the UE shall have through connected the DTCH in both directions.

After step 15 the UE shall respond with a MEASUREMENT REPORT message.

6.1.1.2 LCS Network Induced location request/ UE-Based GPS/ Emergency Call / without USIM

6.1.1.2.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities.

6.1.1.2.2 Conformance requirements

1) A MM connection for an emergency call may be established in all states of the mobility management sublayer which allow MM connection establishment for a normal originating call.

   When a user requests an emergency call establishment the UE will send a CM SERVICE REQUEST message to the network with a CM service type information element indicating emergency call establishment.

   Normally, the UE will be identified by an IMSI or a TMSI. However, if none of these identifiers is available in the UE, then the UE shall use the IMEI for identification purposes.

2) As a serving network option, emergency calls may be established without the network having to apply the security mode procedure as defined in TS 24.008.

   The following are the only cases where the "security procedure not applied" option may be used:

   a) Authentication is impossible because the USIM is absent.

3) Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the UE sends a setup message to its peer entity. This setup message is

   - a SETUP message, if the call to be established is a basic call; and
   - an EMERGENCY SETUP message, if the call to be established is an emergency call.

4) If the IE "UE positioning GPS reference time" is included, the UE shall:

   1> store the IE "GPS Week" in "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as the current GPS week;

   1> store the IE "GPS TOW msec" in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as an estimate of the GPS Time-of-Week at the time of reception of the complete message containing the IE "GPS TOW msec";

NOTE: The UE does not need to apply any compensation on the GPS Time-of-Week.

5) If the IE "UE positioning GPS reference UE position" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS reference UE position" in variable UE_POSITIONING_GPS_DATA; and

   1> use it as a priori knowledge of the approximate location of the UE.

6) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

      3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

         4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

         4> if the IE "GPS timing of Cell wanted" is set to FALSE:

            5> include the IE "GPS TOW msec".

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

Reference(s):

- Conformance requirement 1: TS 24.008 clause 4.5.1.5, TS 22.101 clause 8.
- Conformance requirement 2: TS 33.102, clause 6.4.9.2.
- Conformance requirement 3: TS 24.008, clause 5.2.1.
- Conformance requirement 4: TS 25.331, clause 8.6.7.19.3.7.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.3.8.
- Conformance requirement 6: TS 25.331, clause 8.6.7.19.1b.

6.1.1.2.3 Test Purpose

To verify when an emergency call is initiated by a UE in the "MM idle, no IMSI" state (no USIM inserted) and the network performs a location request using the RRC measurement control procedure by sending Measurement Control message , then the UE respond with a Measurement Report containing UE location.

6.1.1.2.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment:
  - the UE is in MM-state "MM idle, no IMSI", no USIM inserted.

Related PICS/PIXIT Statements

- Emergency speech call yes/no
- UE Based Network Assisted GPS

Test procedure

The UE is made to initiate an emergency call.

After the call has been through-connected in both directions, the SS orders an A-GPS positioning measurement using two MEASUREMENT CONTROL messages. The last MEASUREMENT CONTROL message orders periodical reporting by sending a MEASUREMENT CONTROL message requesting periodical measurement reporting (1 report, interval 64s).

The UE then performs positioning measurements, calculates "UE Positioning Position Estimate Info" and responds with this in the RRC message MEASUREMENT REPORT.

Finally the SS clears the call.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	UE			The "emergency number" is entered. One of the following emergency numbers shall be used: 000, 08, 112, 110, 118, 119, 911 or 999.
2	-->			UE establishes RRC procedure for emergency call. Establishment cause: Emergency Call SS checks that the UE capability includes A-GPS UE based positioning measurement
3	-->		CM SERVICE REQUEST	The CM service type IE indicates "emergency call establishment".
4	<--		CM SERVICE ACCEPT	
5	-->		EMERGENCY SETUP	If the Bearer capability IE is not included the default UMTS AMR speech version shall be assumed.
6	<--		CALL PROCEEDING	
7	<--		ALERTING	
8	<--			SS sets up the radio bearer with the rate indicated by the EMERGENCY SETUP message.
9	<--		CONNECT	
10	-->		CONNECT ACKNOWLEDGE	
11	UE			The DTCH is through connected in both directions.
12	<-		MEASUREMENT CONTROL	
13	<-		MEASUREMENT CONTROL	
14	-->		MEASUREMENT REPORT	
15	<--		DISCONNECT	SS disconnects the call and associated radio bearer.

Specific Message Contents

MEASUREMENT CONTROL (Step 12):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 13):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 14):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	GPS reference time only
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

6.1.1.2.5 Test requirements

After step 10 the UE shall have through connected the DTCH in both directions.

After step 13 the UE shall respond with a MEASUREMENT REPORT message containing a position estimate.

6.1.1.3 LCS Network induced location request/ UE-Assisted GPS/ Emergency call/ With USIM

6.1.1.3.1 Definition

This test case applies to all UEs supporting UE-Assisted GPS Location Service capabilities.

6.1.1.3.2 Conformance requirements

1) A MM connection for an emergency call may be established in all states of the mobility management sublayer which allow MM connection establishment for a normal originating call.

When a user requests an emergency call establishment the UE will send a CM SERVICE REQUEST message to the network with a CM service type information element indicating emergency call establishment.

2) Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the UE sends a setup message to its peer entity. This setup message is

- a SETUP message, if the call to be established is a basic call; and
- an EMERGENCY SETUP message, if the call to be established is an emergency call.

3) if the IE "Measurement command" has the value "setup":

2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

…

2> for any other measurement type:

3> if the measurement is valid in the current RRC state of the UE:

4> begin measurements according to the stored control information for this measurement identity.

4) The UE shall:

1> when a measurement report is triggered:

2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

3> if the IE "Vertical Accuracy" is included:

4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

3> if the IE "Positioning Methods" is set to "GPS":

4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

6> if the IE "GPS timing of Cell wanted" is set to TRUE:

7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

6> if the IE "GPS timing of Cell wanted" is set to FALSE:

7> include the IE "GPS TOW msec".

5> if the UE does not support the capability to provide the GPS timing of the cell:

6> include the IE "GPS TOW msec".

References

- Conformance requirement 1: TS 24.008 clause 4.5.1.5.
- Conformance requirement 2: TS 24.008, clause 5.2.1.
- Conformance requirement 3: TS 25.331, clause 8.4.1.3.
- Conformance requirement 4: TS 25.331, clause 8.6.7.19.1a.

6.1.1.3.3 Test Purpose

To verify when an emergency call is initiated by a UE with a USIM, and the network performs a location request using the RRC measurement control procedure by sending Measurement Control message , then the UE respond with a Measurement Report containing "UE positioning GPS measured results".

6.1.1.3.4 Method of Test

Initial Conditions

System Simulator (SS):

1 cell, default parameters

Satellite signals: As specified in 4.2

UE:

- the UE is in state "MM idle" with valid TMSI and CKSN.

Related PICS/PIXIT Statements

- Emergency speech call yes/no
- UE Assisted Network Assisted GPS

Test Procedure

The UE is made to initiate an emergency call.

After the call has been through-connected in both directions, the SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.3.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE then performs positioning measurements and responds with the RRC message MEASUREMENT REPORT.

Finally the SS clears the call.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	UE			The "emergency number" is entered. Number shall be one programmed in test USIM EF_{ECC} (Emergency Call Codes), ref. 34.108 clause 8.3.2.21.
2	-->			UE establishes RRC procedure for emergency call. Establishment cause: Emergency Call SS checks that the UE capability includes A-GPS UE assisted positioning measurement
3	-->		CM SERVICE REQUEST	The CM service type IE indicates "emergency call establishment".
4	<--		AUTHENTICATION REQUEST	IE Authentication Parameter AUTN shall be present in the message.
5	-->		AUTHENTICATION RESPONSE	SRES specifies correct value.
6	SS			SS starts security procedure.
7	-->		EMERGENCY SETUP	If the Bearer capability IE is not included the default UMTS AMR speech version shall be assumed.
8	<--		CALL PROCEEDING	
9	<--		ALERTING	
10	<--			SS sets up the radio bearer with the rate indicated by the EMERGENCY SETUP message.
11	<--		CONNECT	
12	-->		CONNECT ACKNOWLEDGE	
13	UE			The DTCH is through connected in both directions.
14	<-		MEASUREMENT CONTROL	
15	-->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
15a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 15, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
15b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 15, this message contains the IE "UE positioning GPS measured results".
16	<--		DISCONNECT	SS disconnects the call and associated radio bearer.

Specific Message Contents

MEASUREMENT CONTROL (Step 14):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 15 (Option 1) or 15b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 15 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 15a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	Set according to 4.2 (unequal to 0)
- Vertical accuracy	Set according to 4.2 (unequal to 0)
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

6.1.1.3.5 Test requirements

After step 12 the UE shall have through connected the DTCH in both directions.

After step 14 the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

6.1.1.4 LCS Network induced location request/ UE-Assisted GPS/ Emergency call/ Without USIM

6.1.1.4.1 Definition

This test case applies to all UEs supporting UE-assisted A-GPS Location Service capabilities.

6.1.1.4.2 Conformance requirements

1) A MM connection for an emergency call may be established in all states of the mobility management sublayer which allow MM connection establishment for a normal originating call.

   When a user requests an emergency call establishment the UE will send a CM SERVICE REQUEST message to the network with a CM service type information element indicating emergency call establishment.

   Normally, the UE will be identified by an IMSI or a TMSI. However, if none of these identifiers is available in the UE, then the UE shall use the IMEI for identification purposes.

2) As a serving network option, emergency calls may be established without the network having to apply the security mode procedure as defined in TS 24.008.

   The following are the only cases where the "security procedure not applied" option may be used:

a) Authentication is impossible because the USIM is absent.

3) Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the UE sends a setup message to its peer entity. This setup message is

   - a SETUP message, if the call to be established is a basic call; and
   - an EMERGENCY SETUP message, if the call to be established is an emergency call.

4) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

5) The UE shall:

1> when a measurement report is triggered:

   2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

      3> if the IE "Vertical Accuracy" is included:

         4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

      3> if the IE "Positioning Methods" is set to "GPS":

4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

6> if the IE "GPS timing of Cell wanted" is set to TRUE:

7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

6> if the IE "GPS timing of Cell wanted" is set to FALSE:

7> include the IE "GPS TOW msec".

5> if the UE does not support the capability to provide the GPS timing of the cell:

6> include the IE "GPS TOW msec".

References

- Conformance requirement 1: TS 24.008 clause 4.5.1.5, TS 22.101 clause 8.
- Conformance requirement 2: TS 33.102, clause 6.4.9.2.
- Conformance requirement 3: TS 24.008, clause 5.2.1.
- Conformance requirement 4: TS 25.331, clause 8.4.1.3.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.1a.

6.1.1.4.3 Test Purpose

To verify that when an emergency call is initiated by a UE with no USIM, and the network performs a network-induced location request using UE-assisted A-GPS, the UE responds with a Measurement Report containing the IE "UE positioning GPS measured results".

6.1.1.4.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment:
  - the UE is in state "MM idle" with no IMSI and no USIM inserted.

Related PICS/PIXIT Statements

- Emergency speech call yes/no
- UE Assisted Network Assisted GPS

Test procedure

The UE is made to initiate an emergency call. The call is established without authentication and security.

After the call has been through-connected in both directions, the SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.3.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message including the IE "UE positioning GPS measured results".

Finally the SS clears the call.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	UE			The "emergency number" is entered. One of the following emergency numbers shall be used: 000, 08, 112, 110, 118, 119, 911 or 999.
2	-->			UE establishes RRC procedure for emergency call. Establishment cause: Emergency Call SS checks that the UE capability includes A-GPS UE-assisted positioning measurement.
3	-->		CM SERVICE REQUEST	The CM service type IE indicates "emergency call establishment". The mobile identity IE specifies the IMEI of the UE. The cipher key sequence number IE indicates "no key is available".
4	<--		CM SERVICE ACCEPT	
5	-->		EMERGENCY SETUP	If the Bearer capability IE is not included the default UMTS AMR speech version shall be assumed.
6	<--		CALL PROCEEDING	
7	<--		ALERTING	
8	<--			SS sets up the radio bearer with the rate indicated by the EMERGENCY SETUP message.
9	<--		CONNECT	
10	-->		CONNECT ACKNOWLEDGE	
11	UE			The DTCH is through connected in both directions.
12	<-		MEASUREMENT CONTROL	Assistance data as specified in subclause 4.3.3.
13	-->		MEASUREMENT REPORT	UE reports the IE "UE positioning GPS measured results" (Option 1) or requests additional assistance data (Option 2).
13a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 13, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
13b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 13, this message contains the IE "UE positioning GPS measured results".
14	<--		DISCONNECT	SS disconnects the call and associated radio bearer.

Specific Message Contents

MEASUREMENT CONTROL (Step 12):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in subclause 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 13 (Option 1) or 13b (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 13 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 13a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	Set according to 4.2 (unequal to 0)
- Vertical accuracy	Set according to 4.2 (unequal to 0)
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

6.1.1.4.5 Test requirements

After step 10 the UE shall have through connected the DTCH in both directions.

After step 12 the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

6.1.2 Assisted GPS Mobile Originated Tests

6.1.2.1 LCS Mobile originated location request/ UE-Based GPS/ Position estimate request/ Success

6.1.2.1.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities and providing a method to trigger an MO-LR request for a position estimate.

6.1.2.1.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component.

2) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

3) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

   1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

   1> if an update has been provided for this satellite:

      2> act as specified in subclause 8.6.7.19.3.4.

   If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

   1> update the variable UE_POSITIONING_GPS_DATA as follows:

      2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

   1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

4) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

4> if the IE "GPS timing of Cell wanted" is set to FALSE:

5> include the IE "GPS TOW msec".

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

5) The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component.

6) After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

Reference(s):

- Conformance requirements 1, 5 and 6: TS 24.030, subclause 5.1.1
- Conformance requirement 2: TS 25.331, subclause 8.4.1.3.
- Conformance requirement 3: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4.
- Conformance requirement 4: TS 25.331, subclause 8.6.7.19.1b
- Reference [12] in these conformance requirements denotes document ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

6.1.2.1.3 Test Purpose

To verify the UE behaviour at a mobile originated location request procedure using network-assisted UE-based GPS.

6.1.2.1.4 Method of Test

Initial Conditions

- System Simulator:

- 1 cell, default parameters.
- Satellite signals: As specified in 4.2

- User Equipment:
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- Method of triggering an MO-LR request for a position estimate.

Test Procedure

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

Then the UE invokes an MO-LR request of type "locationEstimate". The SS orders an A-GPS positioning measurement using two MEASUREMENT CONTROL messages, including assistance data. The UE then initiates periodic measurement reporting. After the first received MEASUREMENT REPORT message, the SS responds with a FACILITY message containing an MO-LR result. When UE receives the FACILITY message, it clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "locationEstimate".
7	<-		MEASUREMENT CONTROL	
8	<-		MEASUREMENT CONTROL	
9	->		MEASUREMENT REPORT	
10	<-		FACILITY	LCS MO-LR result message containing location estimate
11	->		RELEASE COMPLETE	The UE terminates the dialogue
12	SS			The SS releases the RRC connection and the test case ends.

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->locationEstimate
SS version indicator	Value 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	Set according to 4.2 (unequal to 0)
- Vertical accuracy	Set according to 4.2 (unequal to 0)
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 9)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	
- GPS reference time only	
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

FACILITY (Step 10)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	FACILITY (0011 1010)
Facility	Return result = LCS-MOLR LCS-MOLRRes -> locationEstimate

RELEASE COMPLETE (Step 11)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)

6.1.2.1.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate".

After step 8, the UE shall respond with a MEASUREMENT REPORT message.

After step 10, the UE shall send a RELEASE COMPLETE message.

6.1.2.2 LCS Mobile originated location request/ UE-Based or UE-Assisted GPS/ Assistance data request/ Success

6.1.2.2.1 Definition

This test case applies to all UEs supporting UE-Based or UE-Assisted GPS Location Service capabilities and providing a method to trigger an MO-LR request for assistance data.

6.1.2.2.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component.

2) The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component.

3) After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

Reference(s):

- Conformance requirements 1, 2 and 3: TS 24.030, subclause 5.1.1

6.1.2.2.3 Test Purpose

To verify the UE behaviour at a mobile originated location request procedure using network-assisted network assisted GPS.

6.1.2.2.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.

- Satellite signals: As specified in 4.2

- User Equipment:

  - The UE shall begin the test with no GPS assistance data stored.

  - The UE is in state "MM idle" with valid TMSI and CKSN.

  - The UE is in state "PMM idle" with valid P-TMSI

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS

- UE Assisted Network Assisted GPS

- Method of clearing stored GPS assistance data

- Method of triggering an MO-LR request for assistance data.

Test Procedure

The stored GPS assistance data in the UE shall be cleared.

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

Then the UE invokes an MO-LR request of type "assistanceData".

The SS transmits an ASSISTANCE DATA delivery message with assistance data. When the assistance data delivery was successful, the SS sends a FACILITY message to the UE.

The UE clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1			Void	
2	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
3	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
4	<-		AUTHENTICATION REQUEST	
5	->		AUTHENTICATION RESPONSE	
6	SS			The SS starts ciphering and integrity protection.
7	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "assistanceData".
8	<-		ASSISTANCE DATA DELIVERY	The SS provides the requested data in one or more ASSISTANCE DATA DELIVERY messages as specified in subclause 4.3.5
9	<-		FACILITY	
10	->		RELEASE COMPLETE	The UE terminates the dialogue
11	SS			The SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 7)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->assistanceData locationMethod -> assistedGPS gpsAssistanceData -> OCTET STRING Octets 1 to 38 are coded in the same way as octets 3 to 7+2n of Requested GPS Data IE in 3GPP TS 49.031 (Contents are not verified, SS will use octet 1 to identify the GPS assistance data requested by the MS)
SS version indicator	Value 1 or above

ASSISTANCE DATA DELIVERY (Step 8):

Information element	Value/remark
Measurement Information Elements	
UE positioning OTDOA assistance data for UE-based	Not present
UE positioning GPS assistance data	Set as specified in 4.3.5.

FACILITY (Step 9)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	FACILITY (0011 1010)
Facility	Return result = LCS-MOLR LCS-MOLRRes -> EMPTY

RELEASE COMPLETE (Step 10)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0x10 1010)

6.1.2.2.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "assistanceData".

After step 8, the UE shall send a RELEASE COMPLETE message.

6.1.2.3 LCS Mobile originated location request/ UE-Assisted GPS/ Position Estimate/ Success

6.1.2.3.1 Definition

This test case applies to all UEs supporting UE-Assisted GPS Location Service capabilities and providing a method to trigger an MO-LR request for a position estimate.

6.1.2.3.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component.

2) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

3) The UE shall:

   1> when a measurement report is triggered:

   2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

      3> if the IE "Vertical Accuracy" is included:

         4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

      3> if the IE "Positioning Methods" is set to "GPS":

         4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

            5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

               6> if the IE "GPS timing of Cell wanted" is set to TRUE:

                  7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

                  7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

                  7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

               6> if the IE "GPS timing of Cell wanted" is set to FALSE:

                  7> include the IE "GPS TOW msec".

            5> if the UE does not support the capability to provide the GPS timing of the cell:

               6> include the IE "GPS TOW msec".

4) The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component.

5) After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

References:

- Conformance requirements 1, 4 and 5: TS 24.030, subclause 5.1.1

- Conformance requirement 2: TS 25.331, subclause 8.4.1.3

- Conformance requirement 3: TS 25.331, subclause 8.6.7.19b

6.1.2.3.3 Test Purpose

To verify the UE behaviour in the mobile-originated location request procedure using network-assisted UE-assisted GPS to request a position estimate from the network.

6.1.2.3.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment:
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI

Related PICS/PIXIT Statements

- UE Assisted Network Assisted GPS
- Method of triggering an MO-LR request for a position estimate.

Test Procedure

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes an MO-LR request through the Facility IE in a REGISTER message. The MO-LR request is of type "locationEstimate".

The SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.3.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE then initiates periodic measurement reporting. After receiving the MEASUREMENT REPORT message, the SS responds with a FACILITY message containing an MO-LR result. When UE receives the FACILITY message, it clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request. The IE "MOLR-Type" is set to "locationEstimate".
7	<-		MEASUREMENT CONTROL	
8	->		MEASUREMENT REPORT	UE reports the IE "UE positioning GPS measured results" (Option 1) or requests additional assistance data (Option 2).
8a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 8, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
8b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 8, this message contains the IE "UE positioning GPS measured results".
9	<-		FACILITY	LCS MO-LR result message containing location estimate
10	->		RELEASE COMPLETE	The UE terminates the dialogue
11	SS			The SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Invoke = LCS-MOLR LCS-MOLRArg molr-Type -> locationEstimate Value 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8 (Option 1) or 8b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 8 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 8a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	Set according to 4.2 (unequal to 0)
- Vertical accuracy	Set according to 4.2 (unequal to 0)
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

FACILITY (Step 9)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) FACILITY (0011 1010) Return result = LCS-MOLR LCS-MOLRRes -> locationEstimate locationEstimate ->any values may be used. The SS shall not be required to calculate the value from the returned gps-MeasureInfo values

RELEASE COMPLETE (Step 10)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type	Call Independent SS message (1011) RELEASE COMPLETE (xx10 1010)

6.1.2.3.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate".

After step 7, the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

After step 9, the UE shall send a RELEASE COMPLETE message.

6.1.2.4 LCS Mobile originated location request/ UE-Based GPS/ Transfer to third party/ Success

6.1.2.4.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities and providing a method to trigger an MO-LR request for transfer to 3rd party.

6.1.2.4.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component.

2) If the UE is requesting that its location be sent to an external LCS client, the message shall include the identity of the LCS client and may include the address of the GMLC through which the LCS client should be accessed.

3) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

4) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

5) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

   1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

   1> if an update has been provided for this satellite:

      2> act as specified in subclause 8.6.7.19.3.4.

   If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

   1> update the variable UE_POSITIONING_GPS_DATA as follows:

      2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

   1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

6) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

      3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

         4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

         4> if the IE "GPS timing of Cell wanted" is set to FALSE:

            5> include the IE "GPS TOW msec".

         4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

            5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

               6> if the UE has been able to calculate a 3-dimensional position:

                  7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

               6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

7) The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component.

8) After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

Reference(s):

- Conformance requirements 1, 7 and 8: TS 24.030, subclause 5.1.1
- Conformance requirement 3: TS 25.331, subclause 8.4.1.3
- Conformance requirement 2: TS 23.171, subclause 8.8.1
- Conformance requirement 4: TS 25.331, subclause 8.4.1.3
- Conformance requirement 5: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4
- Conformance requirement 6: TS 25.331, subclause 8.6.7.19.1b
- Reference [12] in these conformance requirements denotes document ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

6.1.2.4.3 Test Purpose

To verify the UE behaviour in the mobile-originated location request procedure using network-assisted UE-based GPS to request a position estimate from the network for transfer to a third-party LCS client.

6.1.2.4.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment:
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- Method of triggering an MO-LR request for transfer to 3rd party

Test Procedure

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes a MO-LR request through the Facility IE in a REGISTER message. The MO-LR request is of type "locationEstimate". The IE "LCSClientExternalID" is set to the ID of a valid external LCS client.

The SS orders an A-GPS positioning measurement using MEASUREMENT CONTROL messages, including assistance data.

The UE sends a MEASUREMENT REPORT message containing a location estimate.

The SS sends a FACILITY message confirming that the transfer to the external client succeeded. When UE receives the FACILITY message, it clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request. The IE "MOLR-Type" is set to "locationEstimate". The IE "LCSClientExternalID" is set to a valid ID for an external LCS client.
7	<-		MEASUREMENT CONTROL	
8	<-		MEASUREMENT CONTROL	
9	->		MEASUREMENT REPORT	
10	<-		FACILITY	LCS MO-LR result message as confirmation that the position estimate was transferred to the requested LCS client.
11	->		RELEASE COMPLETE	The UE terminates the dialogue
12	SS			The SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->locationEstimate lcsClientExternalID -> externalAddress
SS version indicator	Value 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 9)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	
- GPS reference time only	
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

FACILITY (Step 10)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	FACILITY (0011 1010)
Facility	Return result = LCS-MOLR LCS-MOLRRes -> locationEstimate

RELEASE COMPLETE (Step 11)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)

6.1.2.4.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate" and the IE "LCSClientExternalID" set to the ID of a valid external LCS client.

After step 8, the UE shall respond with a MEASUREMENT REPORT message containing the IE "Position Estimate".

After step 11, the UE shall send a RELEASE COMPLETE message.

6.1.2.5 LCS Mobile originated location request/ UE-Assisted GPS/ Transfer to third party/ Success

6.1.2.5.1 Definition

This test case applies to all UEs supporting UE-Assisted GPS Location Service capabilities and providing a method to trigger an MO-LR request for transfer to 3rd party.

6.1.2.5.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component.

2) If the UE is requesting that its location be sent to an external LCS client, the message shall include the identity of the LCS client and may include the address of the GMLC through which the LCS client should be accessed.

3) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

4) The UE shall:

   1> when a measurement report is triggered:

   2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

3> if the IE "Vertical Accuracy" is included:

4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

3> if the IE "Positioning Methods" is set to "GPS":

4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

6> if the IE "GPS timing of Cell wanted" is set to TRUE:

7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

6> if the IE "GPS timing of Cell wanted" is set to FALSE:

7> include the IE "GPS TOW msec".

5> if the UE does not support the capability to provide the GPS timing of the cell:

6> include the IE "GPS TOW msec".

5) The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component.

6) After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

Reference(s):

- Conformance requirements 1, 5 and 6: TS 24.030, subclause 5.1.1
- Conformance requirement 2: TS 23.171, subclause 8.8.1
- Conformance requirement 3: TS 25.331, subclause 8.4.1.3
- Conformance requirement 4: TS 25.331, subclauses 8.6.7.19.3.3b

6.1.2.5.3 Test Purpose

To verify the UE behaviour in the mobile-originated location request procedure using network-assisted UE-assisted GPS to request a position estimate from the network for transfer to a third-party LCS client.

6.1.2.5.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2.
- User Equipment:
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI.

Related PICS/PIXIT Statements

- UE Assisted Network Assisted GPS
- Method of triggering an MO-LR request for transfer to 3rd party

Test Procedure

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes a MO-LR request through the Facility IE in a REGISTER message. The MO-LR request is of type "locationEstimate". The IE "LCSClientExternalID" is set to the ID of a valid external LCS client.

The SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.3.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message containing IE "UE positioning GPS measured results".

The SS sends a FACILITY message confirming that the transfer to the external client succeeded. When UE receives the FACILITY message, it clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request. The IE "MOLR-Type" is set to "locationEstimate". The IE "LCSClientExternalID" is set to a valid ID for an external LCS client.
7	<-		MEASUREMENT CONTROL	
8	->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
8a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 8, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
8b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 8, this message contains the IE "UE positioning GPS measured results".
9	<-		FACILITY	LCS MO-LR result message as confirmation that the position estimate was transferred to the requested LCS client.
10	->		RELEASE COMPLETE	The UE terminates the dialogue
11	SS			The SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->locationEstimate lcsClientExternalID -> externalAddress
SS version indicator	Value 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Steps 8 (Option 1) or 8b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 8 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 8a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

FACILITY (Step 9)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	FACILITY (0011 1010)
Facility	Return result = LCS-MOLR LCS-MOLRRes -> locationEstimate locationEstimate ->any values may be used. The SS shall not be required to calculate the value from the returned gps-MeasureInfo values

RELEASE COMPLETE (Step 10)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)

6.1.2.5.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate" and the IE "LCSClientExternalID" set to the ID of a valid external LCS client.

After step 7, the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

After step 9, the UE shall send a RELEASE COMPLETE message.

6.1.2.6 LCS Mobile originated location request/ UE-Based or UE-Assisted GPS/ Assistance data request/ Failure

6.1.2.6.1 Definition

This test case applies to all UEs supporting UE-based or UE-assisted GPS Location Service capabilities and providing a method to trigger an MO-LR request for assistance data.

6.1.2.6.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component.

2) If the network is unable to successfully fulfil the request received from the MS (e.g. to provide a location estimate or location assistance information), it shall clear the transaction by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

3) PositionMethodFailure: This error is returned by the network when the network is unable to obtain any of the location information requested or none of the information obtained satisfies the requested LCS QoS or if requested LCS assistance data could not be transferred or requested deciphering keys for broadcast assistance data could not be returned.

Reference(s):

- Conformance requirements 1 and 2: TS 24.030, subclause 5.1.1

- Conformance requirement 3: TS 24.080, subclause 4.3.2.29

6.1.2.6.3 Test Purpose

To verify the UE behaviour at a mobile originated location request for GPS assistance data where the network is unable to provide the requested GPS assistance data.

6.1.2.6.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals switched off or not present
- User Equipment:

  The UE shall begin the test with no GPS assistance data stored.
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS, or UE Assisted Network Assisted GPS
- Method of triggering an MO-LR request for assistance data.
- Method of clearing stored GPS assistance data.

Test Procedure

The stored GPS assistance data in the UE shall be cleared.

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes an MO-LR request of type "assistanceData".

The SS is unable to provide the requested assistance data.

The SS sends a RELEASE COMPLETE message containing a return error component.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1			Void	
2	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
3	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
4	<-		AUTHENTICATION REQUEST	
5	->		AUTHENTICATION RESPONSE	
6	SS			The SS starts ciphering and integrity protection.
7	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "assistanceData".
8	SS			SS is unable to provide the requested assistance data
9	<-		RELEASE COMPLETE	SS terminates the dialogue containing a return error component
10	SS			The SS waits for 10 seconds to verify that the UE does not send a RELEASE COMPLETE message.
11	SS			The SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 7)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->assistanceData locationMethod -> assistedGPS gpsAssistanceData -> OCTET STRING Octets 1 to 38 are coded in the same way as octets 3 to 7+2n of Requested GPS Data IE in 3GPP TS 49.031 (Content is not verified)
SS version indicator	Value 1 or above

RELEASE COMPLETE (Step 9)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)
Facility	Return error = LCS-MOLR Error -> positionMethodFailure

6.1.2.6.5 Test requirements

After step 6 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "assistanceData".

During step 10 the UE shall not send any RELEASE COMPLETE message.

6.1.2.7 LCS Mobile originated location request/ UE-Based GPS/ Position estimate request/ Failure

6.1.2.7.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities and providing a method to trigger an MO-LR request for a position estimate.

6.1.2.7.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

2) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

3) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

   1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

   1> if an update has been provided for this satellite:

      2> act as specified in subclause 8.6.7.19.3.4.

   If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

   1> update the variable UE_POSITIONING_GPS_DATA as follows:

      2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

   1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

4) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

      3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

4> if the IE "GPS timing of Cell wanted" is set to FALSE:

5> include the IE "GPS TOW msec".

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

5) The UE shall set the contents of the IE "UE positioning Error" as follows:

…

1> if the IE "Positioning Methods" in IE "UE positioning reporting quantity" has been assigned to value "GPS":

2> if there were not enough GPS satellites to be received:

3> set IE "Error reason" to "Not Enough GPS Satellites".

2> if some GPS assistance data was missing:

3> set IE "Error reason" to "Assistance Data Missing"; and

3> if the IE ""Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to TRUE:

4> include the IE "GPS Additional Assistance Data Request".

6) If the network is unable to successfully fulfil the request received from the MS (e.g. to provide a location estimate or location assistance information), it shall clear the transaction by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

7) PositionMethodFailure: This error is returned by the network when the network is unable to obtain any of the location information requested or none of the information obtained satisfies the requested LCS QoS or if requested LCS assistance data could not be transferred or requested deciphering keys for broadcast assistance data could not be returned.

Reference(s):

- Conformance requirements 1 and 6: TS 24.030, subclause 5.1.1

- Conformance requirement 2: TS 25.331, subclause 8.4.1.3.
- Conformance requirement 3: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4.
- Conformance requirement 4: TS 25.331, subclause 8.6.7.19.1b
- Conformance requirement 5: TS 25.331, subclause 8.6.7.19.5
- Conformance requirement 7: TS 24.080, subclause 4.3.2.29
- Reference [12] in these conformance requirements denotes document ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

6.1.2.7.3 Test Purpose

To verify the UE behaviour at a mobile originated location request procedure using network-assisted UE-based GPS when the MO-LR procedure fails due to failure of positioning method.

6.1.2.7.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signal switched off or not present
- User Equipment:
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI
  - The UE shall begin the test with no GPS assistance data stored.

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- Method of triggering an MO-LR request for a position estimate.
- Method of clearing stored GPS assistance data

Test Procedure

The stored GPS assistance data in the UE shall be cleared.

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

Then the UE invokes an MO-LR request of type "locationEstimate". The SS orders an A-GPS positioning measurement using two MEASUREMENT CONTROL messages, including assistance data.

The UE sends a MEASUREMENT REPORT message reporting a positioning error for not enough satellite signals received.

The SS sends a RELEASE COMPLETE message containing a return error component.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with a LCS MO-LR request of type "locationEstimate".
7	<-		MEASUREMENT CONTROL	
8	<-		MEASUREMENT CONTROL	
9	->		MEASUREMENT REPORT	Positioning error report "not enough GPS satellites"
10	SS			SS is unable to fulfil the MO-LR request
11	<-		RELEASE COMPLETE	SS terminates the dialogue containing a return error component
12	SS			The SS releases the RRC connection and the test case ends.

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->locationEstimate
SS version indicator	Value 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Not Enough GPS Satellites
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

RELEASE COMPLETE (Step 11)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)
Facility	Return error = LCS-MOLR Error -> positionMethodFailure

6.1.2.7.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with a LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate".

After step 8, the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning error", with "Error reason" set to "Not Enough GPS Satellites".

6.1.3 Assisted GPS Mobile Terminated Tests

6.1.3.1 LCS Mobile terminated location request/ UE-Based GPS

6.1.3.1.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities.

6.1.3.1.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

   In the case of location notification no response is required from the UE, the UE shall terminate the dialogue by sending a RELEASE COMPLETE message containing a LocationNotification return result.

2) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

3) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

   1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

   1> if an update has been provided for this satellite:

2> act as specified in subclause 8.6.7.19.3.4 of TS 25.331.

4) If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

1> update the variable UE_POSITIONING_GPS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in ICD-GPS-200.

5) If the IE "UE positioning GPS reference time" is included, the UE shall:

1> store the IE "GPS Week" in "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as the current GPS week;

1> store the IE "GPS TOW msec" in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as an estimate of the GPS Time-of-Week at the time of reception of the complete message containing the IE "GPS TOW msec";

NOTE: The UE does not need to apply any compensation on the GPS Time-of-Week.

6) If the IE "UE positioning GPS reference UE position" is included, the UE shall:

1> store this IE in the IE "UE positioning GPS reference UE position" in variable UE_POSITIONING_GPS_DATA; and

1> use it as a priori knowledge of the approximate location of the UE.

7) The UE shall when a measurement report is triggered:

2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

4> if the IE "GPS timing of Cell wanted" is set to FALSE:

5> include the IE "GPS TOW msec".

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

References

- Conformance requirement 1: TS 24.030, clause 4.1.1.
- Conformance requirement 2: TS 25.331, clause 8.4.1.3.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.3.3a.
- Conformance requirement 4: TS 25.331, clause 8.6.7.19.3.4.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.3.7.
- Conformance requirement 6: TS 25.331, clause 8.6.7.19.3.8.
- Conformance requirement 7: TS 25.331, clause 8.6.7.19.1b.

6.1.3.1.3 Test Purpose

To verify that when the UE receives a REGISTER message during an established CS call, containing a LCS Location Notification Invoke component set to NotifyLocationAllowed, the UE displays information about the LCS client correctly and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

To verify that the UE responds with a Measurement Report message containing UE location when the assistance data is divided between several Measurement Control messages using Measurement Command "Modify".

6.1.3.1.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals: As specified in 4.2

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE supporting CS domain services
- UE Based Network Assisted GPS
- UE supporting Mobile Terminated Location Request

Test Procedure

The SS initiates authentication and ciphering and sends an SS REGISTER message containing a Facility IE containing a DTAP LCS Location Notification Invoke message set to notifyLocationAllowed. The LCS Client Name contained in the USSD text string of the lcs-LocationNotification shall be displayed. The UE then responds with a RELEASE COMPLETE message containing a LocationNotification return to terminate the dialogue.

The SS orders an A-GPS positioning measurement using two MEASUREMENT CONTROL messages. The last MEASUREMENT CONTROL message orders periodical reporting.

The UE then initiates periodic measurement reporting and sends a MEASUREMENT REPORT message including a location estimate.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<-		AUTHENTICATION REQUEST	
2	->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyLocationAllowed
5	UE			The UE displays information about LCS client
6	->		RELEASE COMPLETE	The UE terminates the dialogue
7	<-		MEASUREMENT CONTROL	
8	<-		MEASUREMENT CONTROL	Periodical reporting is configured.
9	->		MEASUREMENT REPORT	
10	SS			SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = lcs-LocationNotification LocationNotificationArg notificationType -> notifyLocationAllowed, locationType -> current Location , lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = lcs-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 9)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	
- GPS reference time only	
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

6.1.3.1.5 Test requirements

After step 5 the UE shall send a RELEASE COMPLETE message.

After step 8 the UE shall respond with a MEASUREMENT REPORT message.

6.1.3.2 LCS Mobile-terminated location request/UE-Based GPS/ Request for additional assistance data/ Success

6.1.3.2.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities.

6.1.3.2.2 Conformance requirements

1) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

   - if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

     - if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

       5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

       5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

   2) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

      1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

      1> if an update has been provided for this satellite:

         2> act as specified in subclause 8.6.7.19.3.4.

3) If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

   1> update the variable UE_POSITIONING_GPS_DATA as follows:

      2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

   1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

4) If the IE "UE positioning GPS reference time" is included, the UE shall:

   1> store the IE "GPS Week" in "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as the current GPS week;

   - store the IE "GPS TOW msec" in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as an estimate of the GPS Time-of-Week at the time of reception of the complete message containing the IE "GPS TOW msec";

NOTE: The UE does not need to apply any compensation on the GPS Time-of-Week.

   - if the IE "SFN" and IE "UTRAN GPS timing of cell frames" are included:

     if the UE is able to utilise the IEs:

- store these IEs in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA;
- if the IE "Primary CPICH Info" for FDD or IE "cell parameters id" for TDD is not included:
  - if the UE is not in CELL_DCH state:
    - use IEs "SFN" and "UTRAN GPS timing of cell frames" to estimate the relationship between GPS time and air-interface timing of the NODE B transmission in the serving cell.
  - if the UE is in CELL_DCH state:
    - ignore IEs "SFN" and "UTRAN GPS timing of cell frames".
- if the IE "Primary CPICH Info" for FDD or IE "cell parameters id" for TDD is also included:
  - store this IE in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA;
  - use IEs "SFN" and "UTRAN GPS timing of cell frames" to estimate the relationship between GPS time and air-interface timing of the NODE B transmission in the cell indicated by "Primary CPICH info" or "cell parameters id".

- if the IE "SFN-TOW Uncertainty" is included:
  - store this IE in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it to determine if the relationship between GPS time and air-interface timing of the NODE B transmission is known to within at least 10ms.
- if the IE "$T_{UTRAN-GPS}$ drift rate" is included:
  - store this IE in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA; and
    - may use it as an estimate of the drift rate of the NODE B clock relative to GPS time.
  - if the IE "GPS TOW Assist" is included:
    - for each satellite:

      3> delete all information currently stored in the IE "GPS TOW Assist" in the IE "UE positioning GPS reference time" in the variable UE_POSITIONING_GPS_DATA;

      3> store the received GPS TOW Assist information in the IE "UE positioning GPS reference time" in the variable UE_POSITIONING_GPS_DATA.

5) If the IE "UE positioning GPS reference UE position" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS reference UE position" in variable UE_POSITIONING_GPS_DATA; and

   1> use it as a priori knowledge of the approximate location of the UE.

6) If IE "UE positioning GPS ionospheric model" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS ionospheric model" in variable UE_POSITIONING_GPS_DATA;

   1> act on these GPS ionospheric model parameters in a manner similar to that specified in [12].

7) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

- include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:
  - if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or
  - if the IE "GPS timing of Cell wanted" is set to FALSE:
    - include the IE "GPS TOW msec".
  - if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":
    - if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":
      - if the UE has been able to calculate a 3-dimensional position:
        - include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.
      - if the UE has not been able to calculate a 3-dimensional position:
        - act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".
  - if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":
  - if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

8) The UE shall set the contents of the IE "UE positioning Error" as follows:

…

1> if the IE "Positioning Methods" in IE "UE positioning reporting quantity" has been assigned to value "GPS":

2> if there were not enough GPS satellites to be received:

3> set IE "Error reason" to "Not Enough GPS Satellites".

2> if some GPS assistance data was missing:

3> set IE "Error reason" to "Assistance Data Missing"; and

3> if the IE ""Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to TRUE:

4> include the IE "GPS Additional Assistance Data Request".

Reference(s):

- Conformance requirement 1: TS 25.331, subclause 8.4.1.3.
- Conformance requirement 2: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.1b.
- Conformance requirement 4: TS 25.331, clause 8.6.7.19.3.7.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.3.8.
- Conformance requirement 6: TS 25.331, clause 8.6.7.19.3.5.
- Conformance requirement 7: TS 25.331, clause 8.6.7.19.1b.
- Conformance requirement 8: TS 25.331, clause 8.6.7.19.5.

- Reference [12] in these conformance requirements denotes document ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

6.1.3.2.3 Test Purpose

To verify the UE's behaviour in a mobile-terminated location request procedure using UE-based A-GPS with assistance data from the network.

To verify that the UE in CELL_DCH state accepts assistance data received in multiple MEASUREMENT CONTROL messages.

To verify that the UE includes the IE "GPS Additional Assistance Data Request" to request assistance data when it does not have enough assistance data to compute a position.

6.1.3.2.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment:
  - The UE shall begin the test with no GPS assistance data stored.
  - State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- Method of clearing stored GPS assistance data
- UE supporting Mobile Terminated Location Request

Test Procedure

The stored GPS assistance data in the UE shall be cleared.

The SS initiates authentication and ciphering and sends an SS REGISTER message containing a Facility IE containing a DTAP LCS Location Notification Invoke message set to notifyLocationAllowed. The LCS Client Name contained in the USSD text string of the lcs-LocationNotification shall be displayed. The UE then responds with a RELEASE COMPLETE message containing a LocationNotification return to terminate the dialogue.

The SS orders an A-GPS positioning measurement using MEASUREMENT CONTROL including no assistance data.

The UE sends a MEASUREMENT REPORT message to report a positioning error, requesting further assistance data. The SS response with one or more MEASUREMENT CONTROL messages that include the requested assistance data and instructs the UE not to repeat the request for assistance data. The final MEASUREMENT CONTROL message orders periodic reporting.

The UE performs positioning measurements and responds with a MEASUREMENT REPORT message containing a valid position estimate in the IE "UE Positioning Position Estimate Info".

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<-		AUTHENTICATION REQUEST	
2	->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyLocationAllowed
5	UE			The UE displays information about LCS client
6	->		RELEASE COMPLETE	The UE terminates the dialogue
7	<--		MEASUREMENT CONTROL	No assistance data, and "Additional Assistance Data Request" IE set to TRUE.
8	-->		MEASUREMENT REPORT	Positioning error report with request for further assistance data.
9	<--		MEASUREMENT CONTROL	The SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5. The final MEASUREMENT CONTROL message contains: Reporting mode: Periodical reporting Amount of reporting: 1 Reporting interval: 64000
10	-->		MEASUREMENT REPORT	Measurement report message containing UE position estimate.
11	SS			SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) REGISTER (0011 1011) Invoke = lcs-LocationNotification LocationNotificationArg notificationType -> notifyLocationAllowed, locationType -> current Location , lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 6)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) RELEASE COMPLETE (xx10 1010) Return result = lcs-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Measurement Reporting Mode	Not present
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Inadequate assistance data for UE-based A-GPS" in 4.3.2
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Set as required according to position in sequence of messages
- Amount of reporting	Set as required according to position in sequence of messages
- Reporting interval	Set as required according to position in sequence of messages
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 10):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	
- GPS reference time only	
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

6.1.3.2.5 Test Requirements

At step 7 the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning error", with "Error reason" set to "Assistance Data Missing".

At step 9 the UE shall send a MEASUREMENT REPORT message containing a valid UE position estimate.

6.1.3.3 LCS Mobile-terminated location request/UE-Based GPS/ Failure – Not Enough Satellites

6.1.3.3.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities.

6.1.3.3.2 Conformance requirements

1) if the IE "Measurement command" has the value "modify":

2> for all IEs present in the MEASUREMENT CONTROL message:

- if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

- if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

2) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

1> if an update has been provided for this satellite:

2> act as specified in subclause 8.6.7.19.3.4.

3) If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

1> update the variable UE_POSITIONING_GPS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

4) If the IE "UE positioning GPS reference time" is included, the UE shall:

1> store the IE "GPS Week" in "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as the current GPS week;

- store the IE "GPS TOW msec" in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as an estimate of the GPS Time-of-Week at the time of reception of the complete message containing the IE "GPS TOW msec";

NOTE: The UE does not need to apply any compensation on the GPS Time-of-Week.

- if the IE "SFN" and IE "UTRAN GPS timing of cell frames" are included:

- if the UE is able to utilise the IEs:

- store these IEs in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA;

- if the IE "Primary CPICH Info" for FDD or IE "cell parameters id" for TDD is not included:

  - if the UE is not in CELL_DCH state:

    - use IEs "SFN" and "UTRAN GPS timing of cell frames" to estimate the relationship between GPS time and air-interface timing of the NODE B transmission in the serving cell.

  - if the UE is in CELL_DCH state:

    - ignore IEs "SFN" and "UTRAN GPS timing of cell frames".

- if the IE "Primary CPICH Info" for FDD or IE "cell parameters id" for TDD is also included:

  - store this IE in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA;

  - use IEs "SFN" and "UTRAN GPS timing of cell frames" to estimate the relationship between GPS time and air-interface timing of the NODE B transmission in the cell indicated by "Primary CPICH info" or "cell parameters id".

- if the IE "SFN-TOW Uncertainty" is included:

  - store this IE in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it to determine if the relationship between GPS time and air-interface timing of the NODE B transmission is known to within at least 10ms.

- if the IE "$T_{UTRAN-GPS}$ drift rate" is included:

  - store this IE in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA; and

  - may use it as an estimate of the drift rate of the NODE B clock relative to GPS time.

- if the IE "GPS TOW Assist" is included:

  - for each satellite:

    3> delete all information currently stored in the IE "GPS TOW Assist" in the IE "UE positioning GPS reference time" in the variable UE_POSITIONING_GPS_DATA;

    3> store the received GPS TOW Assist information in the IE "UE positioning GPS reference time" in the variable UE_POSITIONING_GPS_DATA.

5) If the IE "UE positioning GPS reference UE position" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS reference UE position" in variable UE_POSITIONING_GPS_DATA; and

   1> use it as a priori knowledge of the approximate location of the UE.

6) If IE "UE positioning GPS ionospheric model" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS ionospheric model" in variable UE_POSITIONING_GPS_DATA;

   1> act on these GPS ionospheric model parameters in a manner similar to that specified in [12].

7) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

- include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

  - if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

  - if the IE "GPS timing of Cell wanted" is set to FALSE:

    - include the IE "GPS TOW msec".

  - if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

    - if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

      - if the UE has been able to calculate a 3-dimensional position:

        - include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

      - if the UE has not been able to calculate a 3-dimensional position:

        - act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

  - if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

  - if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

    6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

8) The UE shall set the contents of the IE "UE positioning Error" as follows:

…

1> if the IE "Positioning Methods" in IE "UE positioning reporting quantity" has been assigned to value "GPS":

2> if there were not enough GPS satellites to be received:

3> set IE "Error reason" to "Not Enough GPS Satellites".

2> if some GPS assistance data was missing:

3> set IE "Error reason" to "Assistance Data Missing"; and

3> if the IE ""Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to TRUE:

4> include the IE "GPS Additional Assistance Data Request".

Reference(s):

- Conformance requirement 1: TS 25.331, subclause 8.4.1.3.
- Conformance requirement 2: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.1b.
- Conformance requirement 4: TS 25.331, clause 8.6.7.19.3.7.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.3.8.
- Conformance requirement 6: TS 25.331, clause 8.6.7.19.3.5.
- Conformance requirement 7: TS 25.331, clause 8.6.7.19.1b.

- Conformance requirement 8: TS 25.331, clause 8.6.7.19.5.

- Reference [12] in these conformance requirements denotes document ICD-GPS-200: "Navstar GPS Space Segment/Navigation User Interface".

6.1.3.3.3 Test Purpose

To verify the UE's behaviour in a mobile-terminated location request procedure using UE-based A-GPS with assistance data from the network.

To verify that the UE in CELL_DCH state accepts assistance data received in multiple MEASUREMENT CONTROL messages.

To verify that the UE sets the IE Error Reason in 'UE Positioning Error' to 'Not Enough GPS Satellites' when it does not receive enough satellite signals to compute a position.

6.1.3.3.4 Method of Test

Initial Conditions

- System Simulator:
  - 1 cell, default parameters.
  - Satellite signals switched off or not present.
- User Equipment:
  - State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.
  - The UE shall begin the test with no GPS assistance data stored.

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- Method of clearing stored GPS assistance data
- UE supporting Mobile Terminated Location Request

Test Procedure

The stored GPS assistance data in the UE shall be cleared.

The SS initiates authentication and ciphering and sends an SS REGISTER message containing a Facility IE containing a DTAP LCS Location Notification Invoke message set to notifyLocationAllowed. The LCS Client Name contained in the USSD text string of the lcs-LocationNotification shall be displayed. The UE then responds with a RELEASE COMPLETE message containing a LocationNotification return to terminate the dialogue.

The SS orders an A-GPS positioning measurement using two MEASUREMENT CONTROL messages. The last MEASUREMENT CONTROL message orders periodical reporting.

The UE sends a MEASUREMENT REPORT message reporting a positioning error for not enough satellite signal.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyLocationAllowed
5	UE			The UE displays information about LCS client
6	->		RELEASE COMPLETE	The UE terminates the dialogue
7	<--		MEASUREMENT CONTROL	
8	<--		MEASUREMENT CONTROL	Periodical reporting is configured
9	-->		MEASUREMENT REPORT	Positioning error report 'not enough GPS satellites'
10	SS			SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) REGISTER (0011 1011) Invoke = lcs-LocationNotification LocationNotificationArg notificationType -> notifyLocationAllowed, locationType -> current Location , lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 6)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) RELEASE COMPLETE (xx10 1010) Return result = lcs-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Not Enough GPS Satellites
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

6.1.3.3.5 Test Requirements

At step 8 the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning error", with "Error reason" set to "Not Enough GPS Satellites".

6.1.3.4 LCS Mobile terminated location request/ UE-Assisted GPS/ Success

6.1.3.4.1 Definition

This test case applies to all UEs supporting UE-Assisted GPS Location Service capabilities.

6.1.3.4.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

   In the case of location notification no response is required from the UE, the UE shall terminate the dialogue by sending a RELEASE COMPLETE message containing a LocationNotification return result.

2) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

3) The UE shall:

   1> when a measurement report is triggered:

   2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

      3> if the IE "Vertical Accuracy" is included:

         4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

      3> if the IE "Positioning Methods" is set to "GPS":

         4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

            5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

               6> if the IE "GPS timing of Cell wanted" is set to TRUE:

                  7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

                  7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

                  7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

               6> if the IE "GPS timing of Cell wanted" is set to FALSE:

                  7> include the IE "GPS TOW msec".

5> if the UE does not support the capability to provide the GPS timing of the cell:

6> include the IE "GPS TOW msec".

References

- Conformance requirement 1: TS 24.030, subclause 5.1.1
- Conformance requirement 2: TS 25.331, clause 8.4.1.3.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.1a.

6.1.3.4.3 Test Purpose

To verify the UE behaviour in the mobile-terminated location request procedure using network-assisted UE-assisted GPS to deliver UE positioning measurements to the network.

6.1.3.4.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals: As specified in 4.2

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE supporting CS domain services
- UE Assisted Network Assisted GPS
- UE supporting Mobile Terminated Location Request

Test Procedure

The SS initiates authentication and ciphering and sends an SS REGISTER message containing a Facility IE containing a DTAP LCS Location Notification Invoke message set to notifyLocationAllowed. The LCS Client Name contained in the USSD text string of the lcs-LocationNotification shall be displayed. The UE then responds with a RELEASE COMPLETE message containing a LocationNotification return to terminate the dialogue.

The SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message. The assistance data is as described in subclause 4.3.3 (Adequate assistance data for UE-assisted A-GPS). The MEASUREMENT CONTROL message orders periodical reporting.

The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE then initiates periodic measurement reporting and sends a MEASUREMENT REPORT message including the IE "UE positioning GPS measured results".

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyLocationAllowed
5	UE			The UE displays information about LCS client
6	->		RELEASE COMPLETE	The UE terminates the dialogue
7	<-		MEASUREMENT CONTROL	Periodical reporting is configured.
8	->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
8a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 8, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
8b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 8, this message contains the IE "UE positioning GPS measured results".
9	SS			SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = lcs-LocationNotification LocationNotificationArg notificationType -> notifyLocationAllowed, locationType -> current Location , lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = lcs-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8 (Option 1) or 8b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 8 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 8a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	Set according to 4.2 (unequal to 0)
- Vertical accuracy	Set according to 4.2 (unequal to 0)
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

6.1.3.4.5 Test requirements

After step 5 the UE shall send a RELEASE COMPLETE message.

After step 7 the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

6.1.3.5 LCS Mobile terminated location request/ UE-Assisted GPS/ Request for additional assistance data/ Success

6.1.3.5.1 Definition

This test case applies to all UEs supporting UE-Assisted GPS Location Service capabilities.

6.1.3.5.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

   In the case of location notification no response is required from the UE, the UE shall terminate the dialogue by sending a RELEASE COMPLETE message containing a LocationNotification return result.

2) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

3) The UE shall:

   1> when a measurement report is triggered:

   2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

      3> if the IE "Vertical Accuracy" is included:

         4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

      3> if the IE "Positioning Methods" is set to "GPS":

         4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

            5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

               6> if the IE "GPS timing of Cell wanted" is set to TRUE:

7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

6> if the IE "GPS timing of Cell wanted" is set to FALSE:

7> include the IE "GPS TOW msec".

5> if the UE does not support the capability to provide the GPS timing of the cell:

6> include the IE "GPS TOW msec".

4) 1> if the UE is not able to report the requested measurement results:

2> include IE "UE positioning error" in the MEASUREMENT REPORT and set the contents of this IE as specified in subclause 8.6.7.19.5.

5) if the IE "Positioning Methods" in IE "UE positioning reporting quantity" has been assigned to value "GPS":

2> if there were not enough GPS satellites to be received:

3> set IE "Error reason" to "Not Enough GPS Satellites".

2> if some GPS assistance data was missing:

3> set IE "Error reason" to "Assistance Data Missing"; and

3> if the IE "Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to FALSE:

4> not include the IE "GPS Additional Assistance Data Request", and use the assistance data available for doing a positioning estimate.

References

- Conformance requirement 1: TS 24.030, subclause 5.1.1
- Conformance requirement 2: TS 25.331, clause 8.4.1.3.
- Conformance requirements 3 and 4: TS 25.331, clause 8.6.7.19.1a.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.5.

6.1.3.5.3 Test Purpose

To verify the UE behaviour in the mobile-terminated location request procedure using network-assisted UE-assisted GPS to deliver UE positioning measurements to the network.

To verify that the UE includes the IE "GPS Additional Assistance Data Request" to request additional assistance data when it does not have enough assistance data to perform the requested measurements.

6.1.3.5.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals: As specified in 4.2

UE:

- The UE shall begin the test with no GPS assistance data stored.
- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE supporting CS domain services
- UE Assisted Network Assisted GPS
- Method of clearing stored GPS assistance data
- UE supporting Mobile Terminated Location Request

Test Procedure

The stored GPS assistance data in the UE shall be cleared.

The SS initiates authentication and ciphering and sends an SS REGISTER message containing a Facility IE containing a DTAP LCS Location Notification Invoke message set to notifyLocationAllowed. The LCS Client Name contained in the USSD text string of the lcs-LocationNotification shall be displayed. The UE then responds with a RELEASE COMPLETE message containing a LocationNotification return to terminate the dialogue.

The SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message. The assistance data is as described in subclause 4.3.2 (Inadequate assistance data for UE-assisted A-GPS). The MEASUREMENT CONTROL message orders periodical reporting.

The UE then initiates periodic measurement reporting and sends a MEASUREMENT REPORT message including a request for additional assistance data. The SS responds with one or more MEASUREMENT CONTROL messages containing assistance data as specified in subclause 4.3.5 (Response to additional assistance data requests from UE). The UE sends a MEASUREMENT REPORT message including the IE "UE positioning GPS measured results".

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyLocationAllowed
5	UE			The UE displays information about LCS client
6	->		RELEASE COMPLETE	The UE terminates the dialogue
7	<-		MEASUREMENT CONTROL	Periodical reporting is configured. Assistance data set as specified in subclause 4.3.2 (Inadequate assistance data for UE-assisted A-GPS).
8	->		MEASUREMENT REPORT	UE requests additional assistance data.
9	<-		MEASUREMENT CONTROL	The SS provides the requested data in one or more MEASUREMENT CONTROL messages as defined in subclause 4.3.5
10	->		MEASUREMENT REPORT	UE sends the IE "UE positioning GPS measured results".
11	SS			SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = lcs-LocationNotification LocationNotificationArg notificationType -> notifyLocationAllowed, locationType -> current Location , lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = lcs-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Inadequate assistance data for UE-assisted A-GPS" in 4.3.2
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Present, if requested by UE
- UTC model	Present, if requested by UE
- Ionospheric model	Present, if requested by UE
- Navigation model	Present, if requested by UE
- DGPS corrections	Present, if requested by UE
- Reference location	Present, if requested by UE
- Reference time	Present, if requested by UE
- Acquisition assistance	Present, if requested by UE
- Real-time integrity	Present, if requested by UE
- Navigation model additional data	Present, if requested by UE
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 10)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

6.1.3.5.5 Test requirements

After step 5 the UE shall send a RELEASE COMPLETE message.

After step 7 the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning error", with "Error reason" set to "Assistance data missing".

After step 9 the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

6.1.3.6 LCS Mobile terminated location request/ UE-Based GPS/ Privacy Verification/ Location Allowed if No Response

6.1.3.6.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities.

6.1.3.6.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

2) In case of privacy verification the MS shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

3) If the timer expires in the network before any response from the MS (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in GSM 03.71 for GSM and TS 23.171 for UMTS (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

4) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

5) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

6) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

   1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

   1> if an update has been provided for this satellite:

      2> act as specified in subclause 8.6.7.19.3.4 of TS 25.331.

7) If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

   1> update the variable UE_POSITIONING_GPS_DATA as follows:

      2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

   1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in ICD-GPS-200.

8) If the IE "UE positioning GPS reference time" is included, the UE shall:

   1> store the IE "GPS Week" in "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as the current GPS week;

   1> store the IE "GPS TOW msec" in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as an estimate of the GPS Time-of-Week at the time of reception of the complete message containing the IE "GPS TOW msec";

   NOTE: The UE does not need to apply any compensation on the GPS Time-of-Week.

9) If the IE "UE positioning GPS reference UE position" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS reference UE position" in variable UE_POSITIONING_GPS_DATA; and

   1> use it as a priori knowledge of the approximate location of the UE.

10) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

4> if the IE "GPS timing of Cell wanted" is set to FALSE:

5> include the IE "GPS TOW msec".

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

References

- Conformance requirement 1, 2 and 3: TS 24.030, clause 4.1.1.
- Conformance requirements 4 and 5: TS 25.331, subclause 8.4.1.3
- Conformance requirement 6: TS 25.331, clause 8.6.7.19.3.3a.
- Conformance requirement 7: TS 25.331, clause 8.6.7.19.3.4.
- Conformance requirement 8: TS 25.331, clause 8.6.7.19.3.7.
- Conformance requirement 9: TS 25.331, clause 8.6.7.19.3.8.
- Conformance requirement 10: TS 25.331, clause 8.6.7.19.1b.

6.1.3.6.3 Test Purpose

To verify that when the UE receives a REGISTER message, containing a LCS Location Notification Invoke component set to notifyAndVerify-LocationAllowedIfNoResponse, the UE notifies the user of the request and indicates that the default response is location allowed if no response and providing the opportunity to accept or deny the request and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied or permissionGranted as appropriate.

6.1.3.6.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals: As specified in 4.2

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- px_UeLcsNotification: value for UE LCS Notification timeout timer
- UE supporting Mobile Terminated Location Request

Test Procedure

The SS initiates authentication and ciphering and sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The LCS Client Name contained in the USSD text string of the lcs-LocationNotification should be displayed with the option to accept or deny the request and an indication that location will be allowed if no user response is received.

The user accepts the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

The SS orders an A-GPS positioning measurement using MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message including a location estimate.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The user denies the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The user ignores the location request by taking no action.

The SS orders an A-GPS positioning measurement using MEASUREMENT CONTROL messages.

The UE then sends a MEASUREMENT REPORT message including a location estimate.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
5	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
6	UE			The UE notifies the user of the location request and indicates to the user that location will be allowed in the absence of a response
7	UE			The user accepts the location request before timer T(LCSN) expires
8	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionGranted
9	<-		MEASUREMENT CONTROL	
10	<-		MEASUREMENT CONTROL	
11	->		MEASUREMENT REPORT	
12	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
13	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
14	UE			The UE notifies the user of the location request and indicates to the user that location will be allowed in the absence of a response
15	UE			The user denies the location request before timer T(LCSN) expires
16	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionDenied
17	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
18	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
19	UE			The UE notifies the user of the location request and indicates to the user that location will be allowed in the absence of a response
20	UE			The user does not reply
21	SS			SS waits until T(LCSN) expires to ensure that the UE does not send a RELEASE COMPLETE message.
22	<-		RELEASE COMPLETE	SS terminates the dialogue
23	<-		MEASUREMENT CONTROL	
24	<-		MEASUREMENT CONTROL	
25	->		MEASUREMENT REPORT	
26	SS			SS releases the connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 8)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 10):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 11)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	
- GPS reference time only	
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

REGISTER (Step 12)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 16)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionDenied

REGISTER (Step 17)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 22)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)

MEASUREMENT CONTROL (Step 23):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 24):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	Not present
Additional Measurements List	Not present
CHOICE *Measurement type*	
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	Set according to 4.2 (unequal to 0)
- Vertical accuracy	Set according to 4.2 (unequal to 0)
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 25)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	
- GPS reference time only	
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

6.1.3.6.5 Test requirements

After step 7 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionGranted.

After step 10 the UE shall respond with a MEASUREMENT REPORT message containing a UE position estimate.

After step 15 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionDenied.

After step 24 the UE shall respond with a MEASUREMENT REPORT message containing a UE position estimate.

6.1.3.7 LCS Mobile terminated location request/ UE-Based GPS/ Privacy Verification/ Location Not Allowed if No Response

6.1.3.7.1 Definition

This test case applies to all UEs supporting UE-Based GPS Location Service capabilities.

6.1.3.7.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

2) In case of privacy verification the MS shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

3) If the timer expires in the network before any response from the MS (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in GSM 03.71 for GSM and TS 23.171 for UMTS (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

4) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

5) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

6) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

   1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

   1> if an update has been provided for this satellite:

      2> act as specified in subclause 8.6.7.19.3.4 of TS 25.331.

7) If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

   1> update the variable UE_POSITIONING_GPS_DATA as follows:

      2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

   1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in ICD-GPS-200.

8) If the IE "UE positioning GPS reference time" is included, the UE shall:

   1> store the IE "GPS Week" in "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as the current GPS week;

   1> store the IE "GPS TOW msec" in the IE "UE positioning GPS reference time" in variable UE_POSITIONING_GPS_DATA and use it as an estimate of the GPS Time-of-Week at the time of reception of the complete message containing the IE "GPS TOW msec";

   NOTE: The UE does not need to apply any compensation on the GPS Time-of-Week.

9) If the IE "UE positioning GPS reference UE position" is included, the UE shall:

   1> store this IE in the IE "UE positioning GPS reference UE position" in variable UE_POSITIONING_GPS_DATA; and

   1> use it as a priori knowledge of the approximate location of the UE.

10) The UE shall when a measurement report is triggered:

   2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or on the list of satellites included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning:

      3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

         4> if the UE does not support the capability to perform the UE GPS timing of cell frames measurement; or

         4> if the IE "GPS timing of Cell wanted" is set to FALSE:

            5> include the IE "GPS TOW msec".

         4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

            5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

               6> if the UE has been able to calculate a 3-dimensional position:

                  7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

               6> if the UE has not been able to calculate a 3-dimensional position:

                  7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

         4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

            5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

               6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

References

- Conformance requirement 1, 2 and 3: TS 24.030, clause 4.1.1.
- Conformance requirements 4 and 5: TS 25.331, clause 8.4.1.3.
- Conformance requirement 6: TS 25.331, clause 8.6.7.19.3.3a.
- Conformance requirement 7: TS 25.331, clause 8.6.7.19.3.4.
- Conformance requirement 8: TS 25.331, clause 8.6.7.19.3.7.
- Conformance requirement 9: TS 25.331, clause 8.6.7.19.3.8.
- Conformance requirement 10: TS 25.331, clause 8.6.7.19.1b.

6.1.3.7.3 Test Purpose

To verify that when the UE receives a REGISTER message, containing a LCS Location Notification Invoke component set to notifyAndVerify-LocationNotAllowedIfNoResponse, the UE notifies the user of the request and indicates that the default response is location not allowed if no response and providing the opportunity to accept or deny the request and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied or permissionGranted as appropriate.

6.1.3.7.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals: As specified in 4.2

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- px_UeLcsNotification: value for UE LCS Notification timeout timer
- UE supporting Mobile Terminated Location Request

Test Procedure

The SS initiates authentication and ciphering and sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The LCS Client Name contained in the USSD text string of the lcs-LocationNotification should be displayed with the option to accept or deny the request and an indication that location will be not allowed if no user response is received.

The user accepts the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

The SS orders an A-GPS positioning measurement using MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message including a location estimate.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The user denies the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The user ignores the location request by taking no action. If the timer expires in the SS before any response from the UE is received, the SS interprets this by applying the default treatment LocationNotAllowed.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
5	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
6	UE			The UE notifies the user of the location request and indicates to the user that location will be not allowed in the absence of a response
7	UE			The user accepts the location request before timer T(LCSN) expires
8	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionGranted
9	<-		MEASUREMENT CONTROL	
10	<-		MEASUREMENT CONTROL	
11	->		MEASUREMENT REPORT	
12	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
13	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
14	UE			The UE notifies the user of the location request and indicates to the user that location will be not allowed in the absence of a response
15	UE			The user denies the location request before timer T(LCSN) expires
16	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionDenied
17	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
18	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
19	UE			The UE notifies the user of the location request and indicates to the user that location will be not allowed in the absence of a response
20	UE			The user does not reply
21	SS			SS waits until T(LCSN) expires to verify that the UE does not send a RELEASE COMPLETE message.
22	<-		RELEASE COMPLETE	SS terminates the dialogue
23	SS			SS releases the connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationNotAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 8)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 10):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	Not present
Additional Measurements List	Not present
CHOICE *Measurement type*	
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GPS" in 4.3.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 11)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	
- GPS reference time only	
- GPS TOW msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

REGISTER (Step 12)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationNotAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 16)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionDenied

REGISTER (Step 17)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationNotAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 22)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)

6.1.3.7.5 Test requirements

After step 7 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionGranted.

After step 10 the UE shall respond with a MEASUREMENT REPORT message containing a UE position estimate.

After step 15 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionDenied.

During step 21 the UE shall not send any RELEASE COMPLETE message.

6.1.3.8 LCS Mobile terminated location request/ UE-Assisted GPS/ Privacy Verification/ Location Allowed if No Response

6.1.3.8.1 Definition

This test case applies to all UEs supporting UE-Assisted GPS Location Service capabilities.

6.1.3.8.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

2) In case of privacy verification the MS shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

3) If the timer expires in the network before any response from the MS (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in GSM 03.71 for GSM and TS 23.171 for UMTS (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

4) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

5) The UE shall:

   1> when a measurement report is triggered:

      2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

         3> if the IE "Vertical Accuracy" is included:

            4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

         3> if the IE "Positioning Methods" is set to "GPS":

            4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

               5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

                  6> if the IE "GPS timing of Cell wanted" is set to TRUE:

                     7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

                     7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

                     7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

                  6> if the IE "GPS timing of Cell wanted" is set to FALSE:

                     7> include the IE "GPS TOW msec".

5> if the UE does not support the capability to provide the GPS timing of the cell:

6> include the IE "GPS TOW msec".

References

- Conformance requirement 1, 2 and 3: TS 24.030, clause 4.1.1.
- Conformance requirement 4: TS 25.331, clause 8.4.1.3.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.3.3b.

6.1.3.8.3 Test Purpose

To verify that when the UE receives a REGISTER message, containing a LCS Location Notification Invoke component set to notifyAndVerify-LocationAllowedIfNoResponse, the UE notifies the user of the request and indicates that the default response is location allowed if no response and providing the opportunity to accept or deny the request and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied or permissionGranted as appropriate.

6.1.3.8.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals: As specified in 4.2

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Assisted Network Assisted GPS
- px_UeLcsNotification: value for UE LCS Notification timeout timer
- UE supporting Mobile Terminated Location Request

Test Procedure

The SS initiates authentication and ciphering and sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The LCS Client Name contained in the USSD text string of the lcs-LocationNotification should be displayed with the option to accept or deny the request and an indication that location will be allowed if no user response is received.

The user accepts the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

The SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.3.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message including IE "UE positioning GPS measured results".

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The user denies the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The user ignores the location request by taking no action. If the timer expires in the SS before any response from the UE is received, the SS interprets this by applying the default treatment LocationAllowed.

The SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.3.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE then sends a MEASUREMENT REPORT message including IE "UE positioning GPS measured results".

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
5	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
6	UE			The UE notifies the user of the location request and indicates to the user that location will be allowed in the absence of a response
7	UE			The user accepts the location request before timer T(LCSN) expires
8	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionGranted
9	<-		MEASUREMENT CONTROL	Assistance data set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
10	->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
10a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 10, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
10b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 10, this message contains the IE "UE positioning GPS measured results".
11	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
12	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
13	UE			The UE notifies the user of the location request and indicates to the user that location will be allowed in the absence of a response
14	UE			The user denies the location request before timer T(LCSN) expires
15	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionDenied
16	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
17	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
18	UE			The UE notifies the user of the location request and indicates to the user that location will be allowed in the absence of a response
19	UE			The user does not reply
20	SS			SS waits until T(LCSN) expires to verify that the UE does not send a RELEASE COMPLETE message.
21	<-		RELEASE COMPLETE	SS terminates the dialogue
22	<-		MEASUREMENT CONTROL	Assistance data set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.5
23	->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
23a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 23, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
23b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 23, this message contains the IE "UE positioning GPS measured results".

24	SS		SS releases the connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) REGISTER (0011 1011) Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 8)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) RELEASE COMPLETE (xx10 1010) Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Steps 10 (Option 1) or 10b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 10 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 10a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

REGISTER (Step 11)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 15)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionDenied

REGISTER (Step 16)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 21)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)

MEASUREMENT CONTROL (Step 22):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Steps 23 (Option 1) or 23b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 23 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 23a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

6.1.3.8.5 Test requirements

After step 7 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionGranted.

After step 9 the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

After step 14 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionDenied.

After step 22 the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

6.1.3.9 LCS Mobile terminated location request/ UE-Assisted GPS/ Privacy Verification/ Location Not Allowed if No Response

6.1.3.9.1 Definition

This test case applies to all UEs supporting UE-Assisted GPS Location Service capabilities.

6.1.3.9.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

2) In case of privacy verification the MS shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

3) If the timer expires in the network before any response from the MS (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in GSM 03.71 for GSM and TS 23.171 for UMTS (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

4) if the IE "Measurement command" has the value "setup":

   2> store this measurement in the variable MEASUREMENT_IDENTITY according to the IE "measurement identity", first releasing any previously stored measurement with that identity if that exists;

   …

   2> for any other measurement type:

      3> if the measurement is valid in the current RRC state of the UE:

         4> begin measurements according to the stored control information for this measurement identity.

5) The UE shall:

   1> when a measurement report is triggered:

      2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

         3> if the IE "Vertical Accuracy" is included:

            4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

         3> if the IE "Positioning Methods" is set to "GPS":

            4> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

               5> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

                  6> if the IE "GPS timing of Cell wanted" is set to TRUE:

7> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

7> include the IE "Reference SFN" and the IE "UE GPS timing of cell frames".

6> if the IE "GPS timing of Cell wanted" is set to FALSE:

7> include the IE "GPS TOW msec".

5> if the UE does not support the capability to provide the GPS timing of the cell:

6> include the IE "GPS TOW msec".

References

- Conformance requirement 1, 2 and 3: TS 24.030, clause 4.1.1.
- Conformance requirement 4: TS 25.331, clause 8.4.1.3.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.3.3b.

6.1.3.9.3 Test Purpose

To verify that when the UE receives a REGISTER message, containing a LCS Location Notification Invoke component set to notifyAndVerify-LocationNotAllowedIfNoResponse, the UE notifies the user of the request and indicates that the default response is location not allowed if no response and providing the opportunity to accept or deny the request and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied or permissionGranted as appropriate.

6.1.3.9.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals: As specified in 4.2

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Assisted Network Assisted GPS
- px_UeLcsNotification: value for UE LCS Notification timeout timer
- UE supporting Mobile Terminated Location Request

Test Procedure

The SS initiates authentication and ciphering and sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The LCS Client Name contained in the USSD text string of the lcs-LocationNotification should be displayed with the option to accept or deny the request and an indication that location will be allowed if no user response is received.

The user accepts the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

The SS orders an A-GPS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.3.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message including IE "UE positioning GPS measured results".

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The user denies the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The user ignores the location request by taking no action. If the timer expires in the SS before any response from the UE is received, the SS interprets this by applying the default treatment LocationNotAllowed.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
5	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
6	UE			The UE notifies the user of the location request and indicates to the user that location will be not allowed in the absence of a response
7	UE			The user accepts the location request before timer T(LCSN) expires
8	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionGranted
9	<-		MEASUREMENT CONTROL	
10	->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
10a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 10, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.3.5.
10b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 10, this message contains the IE "UE positioning GPS measured results".
11	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
12	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
13	UE			The UE notifies the user of the location request and indicates to the user that location will be not allowed in the absence of a response
14	UE			The user denies the location request before timer T(LCSN) expires
15	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionDenied
16	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
17	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
18	UE			The UE notifies the user of the location request and indicates to the user that location will be not allowed in the absence of a response
19	UE			The user does not reply
20	SS			SS waits until T(LCSN) expires to verify that the UE does not send a RELEASE COMPLETE message.
21	<-		RELEASE COMPLETE	SS terminates the dialogue
22	SS			SS releases the connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationNotAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 8)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 9):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GPS" in 4.3.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Steps 10 (Option 1) or 10b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present
- UE positioning error	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT REPORT (Step 10 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS additional assistance data request	
- Almanac	Not checked
- UTC model	Not checked
- Ionospheric model	Not checked
- Navigation model	Not checked
- DGPS corrections	Not checked
- Reference location	Not checked
- Reference time	Not checked
- Acquisition assistance	Not checked
- Real-time integrity	Not checked
- Navigation model additional data	Not checked
Measured Results on RACH	Not present
Additional Measured Results	Not present
Event Results	Not present

MEASUREMENT CONTROL (Step 10a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.3.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

REGISTER (Step 11)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationNotAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 15)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionDenied

REGISTER (Step 16)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationNotAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 21)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0x10 1010)

6.1.3.9.5 Test requirements

After step 7 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionGranted.

After step 9 the UE shall respond with a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results".

After step 14 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionDenied.

During step 20 the UE shall not send any RELEASE COMPLETE message.

6.1.3.10 LCS Mobile terminated location request/ UE-Based or UE-Assisted GPS/ Configuration Incomplete

6.1.3.10.1 Definition

This test case applies to all UEs supporting UE-based or UE-assisted network assisted GPS, but not UE-based OTDOA.

6.1.3.10.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

2) In the case of location notification no response is required from the MS, the MS shall terminate the dialogue by sending a RELEASE COMPLETE message containing a LocationNotification return result.

3) The UE shall perform the following consistency check:

   1> if UE, according to its capabilities, does not support UE-based OTDOA and if IE "Positioning Methods" is set to "OTDOA" and if IE "Method Type" is set to "UE-based":

      2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

   1> if UE, according to its capabilities, does not support UE-based GPS and if IE "Positioning Methods" is set to "GPS" and if IE "Method Type" is set to "UE-based":

      2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

1> if UE, according to its capabilities, does not support UE-assisted GPS and if IE "Positioning Methods" is set to "GPS" and if IE "Method Type" is set to "UE-assisted":

2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

1> if UE, according to its capabilities, does not support UE-based positioning and if IE "Positioning Methods" is set to "OTDOAorGPS" and if IE "Method Type" is set to "UE-based":

2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

1> if UE, according to its capabilities, does not support Rx-Tx time difference type 2 measurement and if IE "Positioning Methods" is set to "Cell ID":

2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

1> if UE, according to its capabilities, does not support UE GPS timing of cell frames measurement and if IE "GPS timing of Cell wanted" is set to TRUE:

2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

4) If the variable CONFIGURATION_INCOMPLETE is set to TRUE, the UE shall:

1> retain the measurement configuration that was valid before the MEASUREMENT CONTROL message was received;

1> set the IE "RRC transaction identifier" in the MEASUREMENT CONTROL FAILURE message to the value of "RRC transaction identifier" in the entry for the MEASUREMENT CONTROL message in the table "Accepted transactions" in the variable TRANSACTIONS and clear that entry;

1> clear the variable CONFIGURATION_INCOMPLETE;

1> set the cause value in IE "failure cause" to "Configuration incomplete";

1> submit the MEASUREMENT CONTROL FAILURE message to lower layers for transmission on the DCCH using AM RLC;

1> continue with any ongoing processes and procedures as if the invalid MEASUREMENT CONTROL message has not been received;

1> and the procedure ends.

5) The UE should set the variable UNSUPPORTED_CONFIGURATION to TRUE if the received message is not according to the UE capabilities.

References

- Conformance requirement 1, 2: TS 24.030, clause 4.1.1.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.1
- Conformance requirement 4: TS 25.331, clause 8.4.1.4a
- Conformance requirement 5: TS 25.331 clause 8.5.20

6.1.3.10.3 Test Purpose

To verify that the UE sends a MEASUREMENT CONTROL FAILURE message, after receiving a MEASUREMENT CONTROL message with IE "Method Type" set a value which is inconsistent with the UE positioning capabilities.

To verify that the UE set the "failure cause" IE to value "configuration incomplete" in the uplink MEASUREMENT CONTROL FAILURE message.

6.1.3.10.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals switched off or not present

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GPS
- UE Assisted Network Assisted GPS
- UE supporting Mobile Terminated Location Request

Test Procedure

The SS initiates authentication and ciphering and sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke component set to notifyLocationAllowed.

The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result.

The SS sends a MEASUREMENT CONTROL message with "Method type" set to a value not supported by the UE as indicated in the "UE positioning capability" contained in the "UE radio access capability" (method not to be supported is UE-based OTDOA).

The UE sends a MEASUREMENT CONTROL FAILURE message with Failure Cause "Configuration Incomplete" or "unsupported configuration.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyLocationAllowed
5	UE			The UE notifies the user of the location request
6	->		RELEASE COMPLETE	The UE terminates the dialogue
7	SS			SS verifies that UE does not support UE-based OTDOA
8	<-		MEASUREMENT CONTROL	IE "Method type" is set to a method not supported by the UE (UE-based OTDOA)
9	->		MEASUREMENT CONTROL FAILURE	Failure cause "Configuration Incomplete" or "Unsupported Configuration"
10	SS			SS releases the connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyLocationAllowed locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

MEASUREMENT CONTROL (Step 8):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE-based
- Positioning methods	OTDOA
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Periodical reporting criteria
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Not present
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL FAILURE (Step 9)

Information Element	Value/remark
RRC transaction identifier	Set to the same value of the same IE in the MEASUREMENT CONTROL message sent in Step 5
Failure cause	Failure cause "Configuration Incomplete" or "Unsupported Configuration"

6.1.3.10.5 Test requirements

After step 5 the UE shall send a RELEASE COMPLETE message.

After step 8, the UE shall transmit MEASUREMENT CONTROL FAILURE message, stating the IE "failure cause" as "configuration incomplete". The UE shall not transmit any MEASUREMENT REPORT messages during the execution of this test case.

6.2 Assisted-GNSS Test Cases

6.2.1 Assisted GNSS Network Induced Tests

6.2.1.1 NI-LR Emergency Call: UE-Based A-GNSS

6.2.1.1.1 Definition

This test case applies to all UEs supporting UE-Based GANSS or GNSS Location Service capabilities.

6.2.1.1.2 Conformance requirements

1) A MM connection for an emergency call may be established in all states of the mobility management sublayer which allow MM connection establishment for a normal originating call.

   When a user requests an emergency call establishment the UE will send a CM SERVICE REQUEST message to the network with a CM service type information element indicating emergency call establishment.

2) Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the UE sends a setup message to its peer entity. This setup message is

   - a SETUP message, if the call to be established is a basic call; and
   - an EMERGENCY SETUP message, if the call to be established is an emergency call.

3) If the IE "UE positioning GANSS reference time" is included, the UE shall:

   1> if the IE "GANSS Day" is included:

      2> store this IE in "UE positioning GANSS reference time" in variable UE_POSITIONING_GANSS_DATA and use it as the current GANSS day.

   1> store the IE "GANSS TOD" in the IE "UE positioning GANSS reference time" in variable UE_POSITIONING_GANSS_DATA and use it as an estimate of the GANSS Time-of-Day at the time of reception of the complete message containing the IE "GANSS TOD";

   NOTE: The UE does not need to apply any compensation on the GANSS Time-of-Day.

   1> if the IE "GANSS Time ID" is not included:

      2> use Galileo system time as a reference for GANSS-Time-of-Day.

   1> if the IE "GANSS Time ID" is included:

      2> use the system time indicated by this IE as a reference for GANSS-Time-of-Day.

4) If the IE "UE positioning GANSS reference UE position" is included, the UE shall:

1> store this IE in the IE "UE positioning GANSS reference UE position" in variable UE_POSITIONING_GANSS_DATA; and

1> use it as a priori knowledge of the approximate location of the UE.

5) If the IE "UE positioning GANSS time model" is included, the UE shall for each GANSS:

1> store the information in "UE positioning GANSS time model" in variable UE_POSITIONING_GANSS_DATA;

1> use the stored parameters to relate GANSS time for the GANSS indicated by "GANSS ID" to time reference indicated by IE "GNSS_TO_ID".

6) The UE shall when a measurement report is triggered:

1> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or the UE has been able to calculate a position in case of GPS or GANSS positioning or the UE has been able to calculate a position using a standalone positioning method:

2> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

3> if the UE supports the capability to provide the GANSS timing of the cell frames measurement;

3> if the IE "GANSS timing of Cell wanted" is not included, or included with each bit set to value zero:

4> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid.

3> if the UE does not support the capability to provide the GANSS timing of the cell:

4> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid;

4> include the IE "GANSS Time ID" to identify the GNSS system time.

3> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

4> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

5> if the UE has been able to calculate a 3-dimensional position:

6> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

5> if the UE has not been able to calculate a 3-dimensional position:

6> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

3> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

4> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

5> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

3> if any of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" is reported:

4> should calculate a value of the IE "Confidence", different from "0", as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" that is reported.

NOTE: The value "0" of the IE "Confidence" is interpreted as "no information" by the UTRAN.

Reference(s):

- Conformance requirement 1: TS 24.008 clause 4.5.1.5.
- Conformance requirement 2: TS 24.008, clause 5.2.1.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.7.7.
- Conformance requirement 4: TS 25.331, clause 8.6.7.19.7.8.
- Conformance requirement 5: TS 25.331, clause 8.6.7.19.7.9.
- Conformance requirement 6: TS 25.331, clause 8.6.7.19.1b.

6.2.1.1.3 Test Purpose

To verify when an emergency call is initiated by a UE, and the network performs a GANSS location request using the RRC measurement control procedure, then the UE responds with a Measurement Report containing UE location estimate.

6.2.1.1.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment (UE):
  - the UE is in state "MM idle" with valid TMSI and CKSN.

Related PICS/PIXIT Statements

- Emergency speech call
- UE Based Network Assisted GANSS
- UE Based Network Assisted GPS (Sub-tests 3, 4, 8 and 10)

Test procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: "A-GPS" includes Modernized GPS if supported by the UE.	

The UE is made to initiate an emergency call.

After the call has been through-connected in both directions, the SS orders an A-GNSS positioning measurement using one or more (dependent on the Sub-Test) MEASUREMENT CONTROL messages. The last MEASUREMENT CONTROL message orders periodical reporting by sending a MEASUREMENT CONTROL message requesting periodical measurement reporting (1 report, interval 64s).

The UE then performs positioning measurements, calculates "UE Positioning Position Estimate Info" and responds with this in the RRC message MEASUREMENT REPORT.

Finally the SS clears the call.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	UE			The "emergency number" is entered. Number shall be one programmed in test USIM EF_{ECC} (Emergency Call Codes), ref. 34.108 clause 8.3.2.21.
2	-->			UE establishes RRC procedure for emergency call. Establishment cause: Emergency Call SS checks that the UE capability includes "Network Assisted GANSS Support List" with "GANSS mode" set to "UE-based", and that the UE includes "Network Assisted GPS Support" for UE-based (Sub-Tests 3, 4, 8 and 10 only).
3	-->		CM SERVICE REQUEST	The CM service type IE indicates "emergency call establishment".
4	<--		AUTHENTICATION REQUEST	IE Authentication Parameter AUTN shall be present in the message.
5	-->		AUTHENTICATION RESPONSE	SRES specifies correct value.
6				SS starts security procedure.
7	-->		EMERGENCY SETUP	If the Bearer capability IE is not included the default UMTS AMR speech version shall be assumed.
8	<--		CALL PROCEEDING	
9	<--		ALERTING	
10	<--			SS sets up the radio bearer with the rate indicated by the EMERGENCY SETUP message.
11	<--		CONNECT	
12	-->		CONNECT ACKNOWLEDGE	
13	UE			The DTCH is through connected in both directions.
14	<--		MEASUREMENT CONTROL	All Sub-Tests
14a	<--		MEASUREMENT CONTROL	Sub-Tests 2, 3, 4, 8, 10 only
14b	<--		MEASUREMENT CONTROL	Sub-Tests 4, 8, 10 only
15	-->		MEASUREMENT REPORT	
16	<--		DISCONNECT	SS disconnects the call and associated radio bearer.

Specific Message Contents

MEASUREMENT CONTROL (Step 14):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	For Sub-Tests 1, 9 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 2, 3, 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 14a):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	For Sub-Tests 2, 3 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 14b):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 15):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	GPS or GANSS reference time only
- GPS TOW msec	Not checked
- GANSS TOD msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- Position Data	Not checked
- CHOICE *Velocity estimate*	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
- UE positioning GANSS measured results	Not present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

6.2.1.1.5 Test requirements

After step 12 the UE shall have through connected the DTCH in both directions.

After step 14, 14a, or 14b (dependent on Sub-Test) the UE shall respond with a MEASUREMENT REPORT message.

6.2.1.2 NI-LR Emergency call: UE-Assisted A-GNSS

6.2.1.2.1 Definition

This test case applies to all UEs supporting UE-Assisted GANSS or GNSS Location Service capabilities.

6.2.1.2.2 Conformance requirements

1) A MM connection for an emergency call may be established in all states of the mobility management sublayer which allow MM connection establishment for a normal originating call.

   When a user requests an emergency call establishment the UE will send a CM SERVICE REQUEST message to the network with a CM service type information element indicating emergency call establishment.

2) Having entered the "MM connection pending" state, upon MM connection establishment, the call control entity of the UE sends a setup message to its peer entity. This setup message is

   - a SETUP message, if the call to be established is a basic call; and

   - an EMERGENCY SETUP message, if the call to be established is an emergency call.

3) The a measurement report is triggered:

   1> if the UE was UE shall when able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one satellite included in the

variable UE_POSITIONING_GANSS_DATA in case of GANSS positioning or one cell from the active set in case of CELL ID:

2> if the IE "Vertical Accuracy" is included:

3> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

2> if the IE "Positioning Methods" is set to "GPS" and if the IE "GANSS Positioning Methods" is not present or if the IE "GANSS Positioning Methods" is present indicating GPS allowed:

3> include the IE "UE positioning GPS measured results" in the measurement report and set the contents of the IE as follows:

4> if the UE supports the capability to provide the GPS timing of the cell frames measurement:

5> if the IE "GPS timing of Cell wanted" is set to FALSE:

7> include the IE "GPS TOW msec" and set it to the GPS TOW when the measurements included in the MEASUREMENT REPORT were valid;

7> include the IE "UE Positioning GPS Reference Time Uncertainty" and set it to the uncertainty of the GPS TOW when the measurements included in the MEASUREMENT REPORT were valid.

4> if the UE does not support the capability to provide the GPS timing of the cell:

5> include the IE "GPS TOW msec" and set it to the GPS TOW when the measurements included in the MEASUREMENT REPORT were valid;

5> include the IE "UE Positioning GPS Reference Time Uncertainty" and set it to the uncertainty of the GPS TOW when the measurements included in the MEASUREMENT REPORT were valid.

2> if the IE "Positioning Methods" is set to "GPS" and the IE "GANSS Positioning Methods" is present indicating other GNSS than GPS allowed and if any of these other GNSSs is measured:

3> include the IE "UE positioning GANSS measured results" in the measurement report and set the contents of the IE as follows:

4> if the UE supports the capability to provide the GANSS timing of the cell frames measurement:

5> if the IE "GANSS timing of Cell wanted" is not included, or included with each bit set to value zero and if IE "UE positioning GPS measured results" is not present:

6> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the measurements included in the MEASUREMENT REPORT were valid.

4> if the UE does not support the capability to provide the GANSS timing of the cell and if IE "UE positioning GPS measured results" is not present:

5> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the measurements included in the MEASUREMENT REPORT were valid.

4> if the UE supports the capability to perform GANSS measurements on multiple GANSS frequencies:

5> if the IE "GANSS Multi-frequency Measurement Requested" is included with one bit set to value one for a supported GANSS, and if any of these GANSS signals are measured:

6> include the IE "GANSS Signal Measurement Information" for each measured GANSS signal.

References

- Conformance requirement 1: TS 24.008 clause 4.5.1.5.

- Conformance requirement 2: TS 24.008, clause 5.2.1.
- Conformance requirement 3: TS 25.331, clause 8.6.7.19.1a.

6.2.1.2.3 Test Purpose

To verify when an emergency call is initiated by a UE, and the network performs a GANSS location request using the RRC measurement control procedure, then the UE responds with a Measurement Report containing "UE positioning GANSS measured results" and "UE positioning GPS measured results" (Sub-tests 3, 4, 8 and 10).

6.2.1.2.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2.
- User Equipment (UE):
  - the UE is in state "MM idle" with valid TMSI and CKSN.

Related PICS/PIXIT Statements

- Emergency speech call
- UE Assisted Network Assisted GANSS
- UE Assisted Network Assisted GPS (Sub-tests 3, 4, 8 and 10)

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: "A-GPS" includes Modernized GPS if supported by the UE.	

The UE is made to initiate an emergency call.

After the call has been through-connected in both directions, the SS orders an A-GNSS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.4.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The UE then performs positioning measurements and responds with the RRC message MEASUREMENT REPORT.

Finally the SS clears the call.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	UE			The "emergency number" is entered. Number shall be one programmed in test USIM EF_{ECC} (Emergency Call Codes), ref. 34.108 clause 8.3.2.21.
2	-->			UE establishes RRC procedure for emergency call. Establishment cause: Emergency Call SS checks that the UE capability includes "Network Assisted GANSS Support List" with "GANSS mode" set to "UE-assisted", and that the UE includes "Network Assisted GPS Support" for UE-assisted (Sub-Tests 3, 4, 8 and 10 only).
3	-->		CM SERVICE REQUEST	The CM service type IE indicates "emergency call establishment".
4	<--		AUTHENTICATION REQUEST	IE Authentication Parameter AUTN shall be present in the message.
5	-->		AUTHENTICATION RESPONSE	SRES specifies correct value.
6	SS			SS starts security procedure.
7	-->		EMERGENCY SETUP	If the Bearer capability IE is not included the default UMTS AMR speech version shall be assumed.
8	<--		CALL PROCEEDING	
9	<--		ALERTING	
10	<--			SS sets up the radio bearer with the rate indicated by the EMERGENCY SETUP message.
11	<--		CONNECT	
12	-->		CONNECT ACKNOWLEDGE	
13	UE			The DTCH is through connected in both directions.
14	<--		MEASUREMENT CONTROL	
15	-->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
15a	<--		MEASUREMENT CONTROL	If UE requested additional assistance data in step 15, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.4.5.
15b	-->		MEASUREMENT REPORT	If UE requested additional assistance data in step 15, this message contains the IE "UE positioning GANSS measured results" and "UE positioning GPS measured results" (Sub-tests 3, 4, 8 and 10).
16	<--		DISCONNECT	SS disconnects the call and associated radio bearer.

Specific Message Contents

MEASUREMENT CONTROL (Step 14):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Set according to UE capabilities
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GNSS" in 4.4.3
- UE positioning GANSS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GNSS" in 4.4.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 15 (Option 1) or 15b (Option 2))

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present for Sub-Tests 3, 4, 8 and 10
- UE positioning error	Not present
- UE positioning GANSS measured results	Present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

MEASUREMENT REPORT (Step 15 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
- Error reason	Assistance Data Missing
- GPS Additional Assistance Data Request	Not checked
- GANSS Additional Assistance Data Request	Not checked
- UE positioning GANSS measured results	Not present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

MEASUREMENT CONTROL (Step 15a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Set according to UE capabilities
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.4.5
- UE positioning GANSS assistance data	Set as specified in 4.4.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

6.2.1.2.5 Test requirements

After step 12 the UE shall have through connected the DTCH in both directions.

After step 14 the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results" and/or "UE positioning GANSS measured results".

6.2.2 Assisted GNSS Mobile Originated Tests

6.2.2.1 MO-LR Position Estimate: UE-Based A-GNSS

6.2.2.1.1 Definition

This test case applies to all UEs supporting UE-Based GANSS or GNSS Location Service capabilities and providing a method to trigger an MO-LR request for a position estimate.

6.2.2.1.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

2) The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component.

3) After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

Reference(s):

- Conformance requirements 1, 2 and 3: TS 24.030, subclause 5.1.1

6.2.2.1.3 Test Purpose

To verify the UE behaviour at a mobile originated location request procedure using network-assisted UE-based GNSS.

6.2.2.1.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment (UE):
  - The UE is in state “MM idle” with valid TMSI and CKSN.
  - The UE is in state “PMM idle” with valid P-TMSI.

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Based Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- Method of triggering an MO-LR request for a position estimate.

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: “A-GPS” includes Modernized GPS if supported by the UE.	

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes an MO-LR request of type "locationEstimate".

The SS orders an A-GNSS positioning measurement using one or more (dependent on the Sub-Test) MEASUREMENT CONTROL messages.

The SS responds with a FACILITY message containing an MO-LR result.

When UE receives the FACILITY message, it clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "locationEstimate".
7	<--		MEASUREMENT CONTROL	All Sub-Tests
7a	<--		MEASUREMENT CONTROL	Sub-Tests 2, 3, 4, 8, 10 only
7b	<--		MEASUREMENT CONTROL	Sub-Tests 4, 8, 10 only
8	->		MEASUREMENT REPORT	
9	<-		FACILITY	LCS MO-LR result message containing a location estimate
10	->		RELEASE COMPLETE	The UE terminates the dialogue
11	SS			The SS releases the RRC connection and the test case ends.

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Register message type	xx11 1011 (REGISTER)
Facility	Invoke=LCS-MOLR molr-Type ->locationEstimate
SS version	Version 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	For Sub-Tests 1, 9 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 2, 3, 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 7a):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	For Sub-Tests 2, 3 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 7b):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
- CHOICE *Reference time*	GPS or GANSS reference time only
- GPS TOW msec	Not checked
- GANSS TOD msec	Not checked
- CHOICE *Position estimate*	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid'
- Position Data	Not checked
- CHOICE *Velocity estimate*	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
- UE positioning GANSS measured results	Not present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

FACILITY (Step 9)

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Facility message type	xx11 1010 (FACILITY)
Facility	Return Result=LCS-MOLRRes → locationEstimate

RELEASE COMPLETE (Step 10)

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Release Complete message type	xx10 1010 (RELEASE COMPLETE)

6.2.2.1.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate".

After step 7, the UE shall respond with a MEASUREMENT REPORT message.

After step 9, the UE shall send a RELEASE COMPLETE message.

6.2.2.2 MO-LR Position Estimate: UE-Assisted A-GNSS

6.2.2.2.1 Definition

This test case applies to all UEs supporting UE-Assisted GANSS or GNSS Location Service capabilities and providing a method to trigger an MO-LR request for a position estimate.

6.2.2.2.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

2) The network shall pass the result of the location procedure to the MS by sending a FACILITY message to the MS containing a LCS-MOLR return result component.

3) After the last location request operation the MS shall terminate the dialogue by sending a RELEASE COMPLETE message.

Reference(s):

- Conformance requirements 1, 2 and 3: TS 24.030, subclause 5.1.1

6.2.2.2.3 Test Purpose

To verify the UE behaviour at a mobile originated location request procedure using network-assisted UE-assisted GNSS.

6.2.2.2.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2
- User Equipment (UE):
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI.

Related PICS/PIXIT Statements

- UE Assisted Network Assisted GANSS.
- UE Assisted Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- Method of triggering an MO-LR request for a position estimate.

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: "A-GPS" includes Modernized GPS if supported by the UE.	

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes an MO-LR request of type "locationEstimate".

The SS orders an A-GNSS positioning measurement using a MEASUREMENT CONTROL message, including assistance data as specified in subclause 4.4.3. The UE may request additional assistance data by sending a MEASUREMENT REPORT message containing a positioning error indication with the IE "Error reason" set to "Assistance Data Missing". If the UE requests additional assistance data, the SS provides the requested assistance data in one or more MEASUREMENT CONTROL messages.

The SS responds with a FACILITY message containing an MO-LR result.

When UE receives the FACILITY message, it clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "locationEstimate".
7	<-		MEASUREMENT CONTROL	
8	->		MEASUREMENT REPORT	UE reports positioning measurement results (Option 1) or requests additional assistance data (Option 2).
8a	<-		MEASUREMENT CONTROL	If UE requested additional assistance data in step 8, SS provides the requested data in one or more MEASUREMENT CONTROL messages as specified in subclause 4.4.5.
8b	->		MEASUREMENT REPORT	If UE requested additional assistance data in step 8, this message contains the IE "UE positioning GANSS measured results" and "UE positioning GPS measured results" (Sub-tests 3, 4, 8 and 10).
9	<-		FACILITY	LCS MO-LR result message containing a location estimate
10	->		RELEASE COMPLETE	The UE terminates the dialogue
11	SS			The SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 6):

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Register message type	xx11 1011 (REGISTER)
Facility	Invoke=LCS-MOLR molr-Type ->locationEstimate
SS version	Version 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Set according to UE capabilities
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GNSS" in 4.4.3
- UE positioning GANSS assistance data	Set as specified for "Adequate assistance data for UE-assisted A-GNSS" in 4.4.3
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8 (Option 1) or 8b (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Present for Sub-Tests 3, 4, 8 and 10
- UE positioning error	Not present
- UE positioning GANSS measured results	Present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

MEASUREMENT REPORT (Step 8 (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	Assistance Data Missing
- GPS Additional Assistance Data Request	Not checked
- GANSS Additional Assistance Data Request	Not checked
- UE positioning GANSS measured results	Not present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

MEASUREMENT CONTROL (Step 8a (Option 2)):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Set according to UE capabilities
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.4.5
- UE positioning GANSS assistance data	Set as specified in 4.4.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

FACILITY (Step 9):

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Facility message type	xx11 1010 (FACILITY)
Facility	Return Result=LCS-MOLRRes → locationEstimate Any values may be used. The SS shall not be required to calculate the value from the returned measurements.

RELEASE COMPLETE (Step 10):

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Release Complete message type	xx10 1010 (RELEASE COMPLETE)

6.2.2.2.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate".

After step 7, the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning GPS measured results" and/or "UE positioning GANSS measured results".

After step 9, the UE shall send a RELEASE COMPLETE message.

6.2.2.3 MO-LR Position Estimate: UE-Based A-GNSS – Failure Not Enough Satellites

6.2.2.3.1 Definition

This test case applies to all UEs supporting UE-Based GANSS or GNSS Location Service capabilities and providing a method to trigger an MO-LR request for a position estimate.

6.2.2.3.2 Conformance requirements

1) The MS invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

2) if the IE "Measurement command" has the value "modify":

2> for all IEs present in the MEASUREMENT CONTROL message:

3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GANSS assistance data" is present, for any of the optional IEs "UE positioning GANSS reference time", "UE positioning GANSS reference UE position", "UE positioning DGANSS corrections", "UE positioning GANSS ionospheric model", "UE positioning GANSS additional ionospheric model", "UE positioning GANSS UTC model", "UE positioning GANSS additional UTC models", "UE positioning GANSS reference measurement information", "UE positioning GANSS data bit assistance", "UE positioning GANSS Time model", "UE positioning GANSS real-time integrity", "UE positioning GANSS Earth orientation parameters", "UE positioning GANSS auxiliary information" that are present in the MEASUREMENT CONTROL message:

5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

3) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

1> if an update has been provided for this satellite:

2> act as specified in subclause 8.6.7.19.3.4.

If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

1> update the variable UE_POSITIONING_GPS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

4) If the IE "UE positioning GANSS Navigation Model" is included, the UE shall:

1> for each GANSS:

2> for each satellite, the UE shall:

3> for IE "UE positioning GANSS clock model":

4> act as specified in subclause 8.6.7.19.7.4a.

3> for IE "UE positioning GANSS orbit model":

4> act as specified in subclause 8.6.7.19.7.4b.

5) If the IE "UE positioning GANSS clock model" is included, the UE shall:

1> for each GANSS:

2> update the variable UE_POSITIONING_GANSS_DATA as follows:

3> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GANSS Navigation Model" in the variable UE_POSITIONING_GANSS_DATA, possibly overwriting any existing information in this position.

2> act on these GANSS clock models in a manner similar to that specified in a relevant ICD.

6) If the IE "UE positioning GANSS orbit model" is included, for each satellite of each supported GNSS, the UE shall:

1> update the variable UE_POSITIONING_GANSS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GANSS Navigation Model" in the variable UE_POSITIONING_GANSS_DATA, possibly overwriting any existing information in this position..

1> act on these GANSS orbit models in a manner similar to that specified in a relevant ICD.

7) The UE shall when a measurement report is triggered:

2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or the UE has been able to calculate a position in case of GPS or GANSS positioning or the UE has been able to calculate a position using a standalone positioning method:

3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE supports the capability to perform the UE GPS timing of cell frames measurement:

5> if the IE "GPS timing of Cell wanted" is set to TRUE:

6> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

6> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD;

6> include the SFN when the position was determined;

6> include the IE "UE GPS timing of cell frames";

6> include the IE "UE Positioning GPS Reference Time Uncertainty".

5> if the IE "GPS timing of Cell wanted" is set to FALSE:

6> include the IE "GPS TOW msec" and set it to the GPS TOW when the position estimate was valid.

4> if the position was calculated with GPS; and

4> the UE does not support the capability to provide the GPS timing of the cell:

5> include the IE "GPS TOW msec" and set it to the GPS TOW when the position estimate was valid.

4> if the UE supports the capability to provide the GANSS timing of the cell frames measurement:

5> if the IE "GANSS timing of Cell wanted" is included with one bit set to value one for a supported GANSS:

6> perform the UE GANSS timing of cell frames measurement on the serving cell or on one cell of the active set;

6> include the IE "GANSS Time ID" to identify the GNSS system time;

6> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

6> include the IE "Reference SFN" and the IE "UE GANSS timing of cell frames".

5> if the IE "GANSS timing of Cell wanted" is not included, or included with each bit set to value zero:

6> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid.

4> if the UE does not support the capability to provide the GANSS timing of the cell:

5> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid;

5> include the IE "GANSS Time ID" to identify the GNSS system time.

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to value "0":

6> if the IE "Horizontal Accuracy" has been assigned a value "0":

7> may include IE "Ellipsoid point with altitude".

6> if the IE "Horizontal Accuracy" has been assigned a value unequal to "0"; and

6> if the UE has been able to calculate a 3-dimensional position

7> include IE "Ellipsoid point with altitude" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> may act as if IE "Vertical Accuracy" was not included in IE "UE positioning reporting quantity".

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

4> if any of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" is reported:

5> should calculate a value of the IE "Confidence", different from "0", as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" that is reported.

NOTE: The value "0" of the IE "Confidence" is interpreted as "no information" by the UTRAN [57].

4> if IE "Velocity Requested" has been included in IE "UE positioning reporting quantity":

5> include IE "Velocity estimate" if supported and available.

2> if the UE was not able to calculate a position:

3> include IE "UE positioning error" in the MEASUREMENT REPORT and set the contents of this IE as specified in subclause 8.6.7.19.5.

8) The UE shall set the contents of the IE "UE positioning Error" as follows:

…

1> if the IE "Positioning Methods" in IE "UE positioning reporting quantity" has been assigned to value "GPS" and the IE "GANSS Positioning Methods" is present:

2> if there were not enough GANSS satellites to be received:

3> set IE "Error reason" to "Not Enough GANSS Satellites".

2> if some GANSS assistance data was missing:

3> set IE "Error reason" to "Assistance Data Missing"; and

3> if the IE "Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to TRUE:

4> include the IE "GANSS Additional Assistance Data Request".

3> if the IE "Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to FALSE:

4> not include the IE "GANSS Additional Assistance Data Request", and use the assistance data available for doing a positioning estimate.

9) If the network is unable to successfully fulfil the request received from the MS (e.g. to provide a location estimate or location assistance information), it shall clear the transaction by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

10) PositionMethodFailure: This error is returned by the network when the network is unable to obtain any of the location information requested or none of the information obtained satisfies the requested LCS QoS or if requested LCS assistance data could not be transferred or requested deciphering keys for broadcast assistance data could not be returned.

Reference(s):

- Conformance requirements 1 and 9: TS 24.030, subclause 5.1.1
- Conformance requirement 2: TS 25.331, subclause 8.4.1.3.
- Conformance requirement 3: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4.
- Conformance requirement 4: TS 25.331, subclause 8.6.7.19.7.4
- Conformance requirement 5: TS 25.331, subclause 8.6..7.19.4a
- Conformance requirement 6: TS 25.331, subclause 8.6.7.19.4b
- Conformance requirement 7: TS 25.331, subclause 8.6.7.19.1b
- Conformance requirement 8: TS 25.331, subclause 8.6.7.19.1b
- Conformance requirement 9: TS 25.331, subclause 8.6.7.19.5
- Conformance requirement 10: TS 24.080, subclause 4.3.2.29

6.2.2.3.3 Test Purpose

To verify the UE behaviour at a mobile originated location request procedure using network-assisted UE-based GNSS when the MO-LR procedure fails due to failure of positioning method.

6.2.2.3.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signals switched off or not present.
- User Equipment (UE):
  - The UE is in state “MM idle” with valid TMSI and CKSN.
  - The UE is in state “PMM idle” with valid P-TMSI

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Based Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- Method of triggering an MO-LR request for a position estimate.

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: "A-GPS" includes Modernized GPS if supported by the UE.	

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes an MO-LR request of type "locationEstimate".

The SS orders an A-GNSS positioning measurement using one or more (dependent on the Sub-Test) MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message with a positioning error indication.

The SS sends a RELEASE COMPLETE message containing a return error component.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "locationEstimate".
7	<--		MEASUREMENT CONTROL	All Sub-Tests
7a	<--		MEASUREMENT CONTROL	Sub-Tests 2, 3, 4, 8, 10 only
7b	<--		MEASUREMENT CONTROL	Sub-Tests 4, 8, 10 only
8	->		MEASUREMENT REPORT	Positioning error report "not enough GANSS satellites" or "not enough GPS satellites" (sub-tests 3, 4, 8 and 10 only)
9	SS			SS is unable to fulfil the MO-LR request
10	<-		RELEASE COMPLETE	SS terminates the dialogue containing a return error component
11	SS			The SS releases the RRC connection and the test case ends.

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Register message type	xx11 1011 (REGISTER)
Facility	Invoke=LCS-MOLR molr-Type ->locationEstimate
SS version	Version 1 or above

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	For Sub-Tests 1, 9 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 2, 3, 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 7a):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	For Sub-Tests 2, 3 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 7b):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	
- Error reason	notEnoughGANSS-Satellites or notEnoughGPS-Satellites (sub-tests 3, 4, 8 and 10 only)
- UE positioning GANSS measured results	Not present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

RELEASE COMPLETE (Step 10)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)
Facility	Return error = LCS-MOLR Error -> positionMethodFailure

6.2.2.3.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "locationEstimate".

After step 7b, the UE shall respond with a MEASUREMENT REPORT message.

6.2.2.4 MO-LR Assistance Data: UE-Based or UE-Assisted A-GNSS - Success

6.2.2.4.1 Definition

This test case applies to all UEs supporting UE-Based or UE-Assisted GANSS or GNSS Location Service capabilities and providing a method to trigger an MO-LR request for a assistance data.

6.2.2.4.2 Conformance requirements

1) The UE invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

2) The network shall send a FACILITY message to the UE containing a LCS-MOLR return result component.

3) After the last location request operation the UE shall terminate the dialogue by sending a RELEASE COMPLETE message.

Reference(s):

- Conformance requirements 1, 2 and 3: TS 24.030, subclause 5.1.1

6.2.2.4.3 Test Purpose

To verify the UE behaviour at a mobile originated location request procedure using network-assisted UE-based or UE-assisted GNSS.

6.2.2.4.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signal s: As specified in 4.2
- User Equipment (UE):
  - The UE is in state “MM idle” with valid TMSI and CKSN.
  - The UE is in state “PMM idle” with valid P-TMSI.

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Based Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- UE Assisted Network Assisted GANSS.
- UE Assisted Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- Method of triggering an MO-LR request for assistance data.

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: “A-GPS” includes Modernized GPS if supported by the UE.	

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes an MO-LR request of type "AssistanceData".

The SS transmits an ASSISTANCE DATA delivery message with assistance data. When the assistance data delivery was successful, the SS sends a FACILITY message to the UE.

The SS responds with a FACILITY message containing an MO-LR result.

When the UE receives the FACILITY message, it clears the transaction by sending a RELEASE COMPLETE message.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "AssistanceData".
7	<-		ASSISTANCE DATA DELIVERY	The SS provides the requested data in one or more ASSISTANCE DATA DELIVERY messages as specified in subclause 4.4.5.
8	<-		FACILITY	
9	->		RELEASE COMPLETE	The UE terminates the dialogue
10	SS			The SS releases the RRC connection and the test case ends.

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	For sub-tests 1, 2, 9: Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->assistanceData locationMethod -> assistedGANSS ganssAssistanceData -> OCTET STRING Octets 1 to 40 are coded in the same way as the octets 3 to 9+2n of Requested GANSS Data IE in 3GPP TS 49.031 For sub-tests 3, 4, 8 and 10: Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->assistanceData locationMethod ->assistedGPSandGANSS gpsAssistanceData -> OCTET STRING Octets 1 to 38 are coded in the same way as octets 3 to 7+2n of Requested GPS Data IE in 3GPP TS 49.031 ganssAssistanceData -> OCTET STRING Octets 1 to 40 are coded in the same way as the octets 3 to 9+2n of requested GANSS Data IE in 3GPP TS 49.031
SS Version	Value 1 or above

ASSISTANCE DATA DELIVERY (Step 7):

Information element	Value/remark
Measurement Information Elements	
UE positioning OTDOA assistance data for UE-based	Not present
UE positioning GPS assistance data	Not present for sub-tests 1, 2 and 9. For sub-tests 3, 4, 8 and 10 set as specified in 4.4.5
UE positioning GANSS assistance data	Set as specified in 4.4.5

FACILITY (Step 8)

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Facility message type	xx11 1010 (FACILITY)
Facility	Return Result=LCS-MOLRRes → EMPTY

RELEASE COMPLETE (Step 9)

Information element	Value/remark
Supplementary service protocol discriminator	1011 (supplementary services (call independent))
Transaction identifier	
Release Complete message type	xx10 1010 (RELEASE COMPLETE)

6.2.2.4.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "assistanceData".

After step 8, the UE shall send a RELEASE COMPLETE message.

6.2.2.5 MO-LR Assistance Data: UE-Based or UE-Assisted A-GNSS - Failure

6.2.2.5.1 Definition

This test case applies to all UEs supporting UE-Based or UE-Assisted GANSS or GNSS Location Service capabilities and providing a method to trigger an MO-LR request for assistance data.

6.2.2.5.2 Conformance requirements

1) The UE invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component.

2) If the network is unable to successfully fulfil the request received from the UE (e.g. to provide a location estimate or location assistance information), it shall clear the transaction by sending a RELEASE COMPLETE message containing a return error component. Error values are specified in 3GPP TS 24.080.

3) PositionMethodFailure: This error is returned by the network when the network is unable to obtain any of the location information requested or none of the information obtained satisfies the requested LCS QoS or if requested LCS assistance data could not be transferred or requested deciphering keys for broadcast assistance data could not be returned.

Reference(s):

- Conformance requirements 1 and 2: TS 24.030, subclause 5.1.1

- Conformance requirement 3: TS 24.080, subclause 4.3.2.29

6.2.2.5.3 Test Purpose

To verify the UE behaviour at a mobile originated location request for assistance data where the network is unable to provide the requested assistance data.

6.2.2.5.4 Method of Test

Initial Conditions

- System Simulator (SS):

- 1 cell, default parameters.
- Satellite signals: As specified in 4.2

- User Equipment (UE):

  The UE shall begin the test with neither GPS nor GANSS assistance data stored.

  - The UE is in state “MM idle” with valid TMSI and CKSN.
  - The UE is in state “PMM idle” with valid P-TMSI

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Based Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- UE Assisted Network Assisted GANSS.
- UE Assisted Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- Method of triggering an MO-LR request for assistance data.

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: "A-GPS" includes Modernized GPS if supported by the UE.	

The UE invokes call independent supplementary service through a CM SERVICE REQUEST. The SS initiates authentication and ciphering.

The UE invokes an MO-LR request of type "assistanceData".

The SS is unable to provide the requested assistance data.

The SS sends a RELEASE COMPLETE message containing a return error component.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	->			The UE establishes an RRC connection for location service. The SS verifies that the IE "Establishment cause" in the received RRC CONNECTION REQUEST message is set to "Originated High Priority Signalling".
2	->		CM SERVICE REQUEST	The CM service type IE indicates "call independent supplementary service"
3	<-		AUTHENTICATION REQUEST	
4	->		AUTHENTICATION RESPONSE	
5	SS			The SS starts ciphering and integrity protection.
6	->		REGISTER	Call Independent SS containing Facility IE with an LCS MO-LR request of type "AssistanceData".
7	SS			SS is unable to provide the requested assistance data
8	<-		RELEASE COMPLETE	SS terminates the dialogue containing a return error component
9	SS			The SS waits for 10 seconds to verify that the UE does not send a RELEASE COMPLETE message.
10	SS			The SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (xx11 1011)
Facility	Sub-tests 1, 2 and 9: Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->assistanceData locationMethod -> assistedGANSS ganssAssistanceData -> OCTET STRING Octets 1 to 40 are coded in the same way as octets 3 to 9+2n of Requested GANSS Data IE in 3GPP TS 49.031 Sub-tests 3, 4, 8 and 10: Invoke = LCS-MOLR LCS-MOLRArg molr-Type ->assistanceData LocationMethod ->assistedGPSandGANSS gpsAssistanceData -> OCTET STRING Octets 1 to 38 are coded in the same way as octets 3 to 7+2n of Requested GPS Data IE in 3GPP TS 49.031
SS version indicator	ganssAssistanceData -> OCTET STRING Octets 1 to 40 are coded in the same way as the octets 3 to 9+2n of requested GANSS Data IE in 3GPP TS 49.031 Value 1 or above

RELEASE COMPLETE (Step 8)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)
Facility	Return error = LCS-MOLR Error -> positionMethodFailure

6.2.2.5.5 Test requirements

After step 5 the UE shall transmit a REGISTER message with an LCS MO-LR request with the IE "MOLR-Type" set to "assistanceData".

During step 9 the UE shall not send any RELEASE COMPLETE message.

6.2.3 Assisted GNSS Mobile Terminated Tests

6.2.3.1 MT-LR: UE-based or UE-Assisted A-GNSS – Request for additional assistance data/ Success

6.2.3.1.1 Definition

This test case applies to all UEs supporting UE-Based or UE-Assisted GANSS or GNSS Location Service capabilities.

6.2.3.1.2 Conformance requirements

1) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GANSS assistance data" is present, for any of the optional IEs "UE positioning GANSS reference time", "UE positioning GANSS reference UE position", "UE positioning DGANSS corrections", "UE positioning GANSS ionospheric model", "UE positioning GANSS additional ionospheric model", "UE positioning GANSS UTC model", "UE positioning GANSS additional UTC models", "UE positioning GANSS reference measurement information", "UE positioning GANSS data bit assistance", "UE positioning GANSS Time model", "UE positioning GANSS real-time integrity", "UE positioning GANSS Earth orientation parameters", "UE positioning GANSS auxiliary information" that are present in the MEASUREMENT CONTROL message:

            5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

            5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

2) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

   1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

1> if an update has been provided for this satellite:

2> act as specified in subclause 8.6.7.19.3.4.

If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

1> update the variable UE_POSITIONING_GPS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

3) If the IE "UE positioning GANSS Navigation Model" is included, the UE shall:

1> for each GANSS:

2> for each satellite, the UE shall:

3> for IE "UE positioning GANSS clock model":

4> act as specified in subclause 8.6.7.19.7.4a.

3> for IE "UE positioning GANSS orbit model":

4> act as specified in subclause 8.6.7.19.7.4b.

4) If the IE "UE positioning GANSS clock model" is included, the UE shall:

1> for each GANSS:

2> update the variable UE_POSITIONING_GANSS_DATA as follows:

3> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GANSS Navigation Model" in the variable UE_POSITIONING_GANSS_DATA, possibly overwriting any existing information in this position.

2> act on these GANSS clock models in a manner similar to that specified in a relevant ICD.

5) If the IE "UE positioning GANSS orbit model" is included, for each satellite of each supported GNSS, the UE shall:

1> update the variable UE_POSITIONING_GANSS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GANSS Navigation Model" in the variable UE_POSITIONING_GANSS_DATA, possibly overwriting any existing information in this position..

1> act on these GANSS orbit models in a manner similar to that specified in a relevant ICD.

6) The UE shall when a measurement report is triggered:

2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or the UE has been able to calculate a position in case of GPS or GANSS positioning or the UE has been able to calculate a position using a standalone positioning method:

3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE supports the capability to perform the UE GPS timing of cell frames measurement:

5> if the IE "GPS timing of Cell wanted" is set to TRUE:

6> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

6> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD;

6> include the SFN when the position was determined;

6> include the IE "UE GPS timing of cell frames";

6> include the IE "UE Positioning GPS Reference Time Uncertainty".

5> if the IE "GPS timing of Cell wanted" is set to FALSE:

6> include the IE "GPS TOW msec" and set it to the GPS TOW when the position estimate was valid.

4> if the position was calculated with GPS; and

4> the UE does not support the capability to provide the GPS timing of the cell:

5> include the IE "GPS TOW msec" and set it to the GPS TOW when the position estimate was valid.

4> if the UE supports the capability to provide the GANSS timing of the cell frames measurement:

5> if the IE "GANSS timing of Cell wanted" is included with one bit set to value one for a supported GANSS:

6> perform the UE GANSS timing of cell frames measurement on the serving cell or on one cell of the active set;

6> include the IE "GANSS Time ID" to identify the GNSS system time;

6> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

6> include the IE "Reference SFN" and the IE "UE GANSS timing of cell frames".

5> if the IE "GANSS timing of Cell wanted" is not included, or included with each bit set to value zero:

6> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid.

4> if the UE does not support the capability to provide the GANSS timing of the cell:

5> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid;

5> include the IE "GANSS Time ID" to identify the GNSS system time.

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to value "0":

6> if the IE "Horizontal Accuracy" has been assigned a value "0":

7> may include IE "Ellipsoid point with altitude".

6> if the IE "Horizontal Accuracy" has been assigned a value unequal to "0"; and

6> if the UE has been able to calculate a 3-dimensional position

7> include IE "Ellipsoid point with altitude" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> may act as if IE "Vertical Accuracy" was not included in IE "UE positioning reporting quantity".

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

4> if any of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" is reported:

5> should calculate a value of the IE "Confidence", different from "0", as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" that is reported.

NOTE: The value "0" of the IE "Confidence" is interpreted as "no information" by the UTRAN [57].

4> if IE "Velocity Requested" has been included in IE "UE positioning reporting quantity":

5> include IE "Velocity estimate" if supported and available.

2> if the UE was not able to calculate a position:

3> include IE "UE positioning error" in the MEASUREMENT REPORT and set the contents of this IE as specified in subclause 8.6.7.19.5.

7) The UE shall:

1> when a measurement report is triggered:

2> if the UE was able to perform measurements on at least one neighbour cell included in the variable UE_POSITIONING_OTDOA_DATA_UE_ASSISTED in case of OTDOA or one satellite included in the variable UE_POSITIONING_GPS_DATA in case of GPS positioning or one cell from the active set in case of CELL ID:

3> if the IE "Vertical Accuracy" is included:

4> interpret the presence of this IE to indicate that the UTRAN desires to compute a 3-dimensional position estimate.

if the IE "Positioning Methods" is set to "GPS" and the IE "GANSS Positioning Methods" is present indicating other GNSS than GPS allowed and if any of these other GNSSs is measured:

4> include the IE "UE positioning GANSS measured results" in the measurement report and set the contents of the IE as follows:

5> if the UE supports the capability to provide the GANSS timing of the cell frames measurement:

6> if the IE "GANSS timing of Cell wanted" is included with one bit set to value one for a supported GANSS and if IE "UE GPS timing of cell frames" is not present:

7> perform the UE GANSS timing of cell frames measurement on the serving cell or on one cell of the active set;

7> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

7> include the IE "Reference SFN" and the IE "UE GANSS timing of cell frames".

6> if the IE "GANSS timing of Cell wanted" is not included, or included with each bit set to value zero and if IE "UE positioning GPS measured results" is not present:

7> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the measurements included in the MEASUREMENT REPORT were valid.

5> if the UE does not support the capability to provide the GANSS timing of the cell and if IE "UE positioning GPS measured results" is not present:

6> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the measurements included in the MEASUREMENT REPORT were valid.

5> if the UE supports the capability to provide the GANSS carrier-phase measurements:

6> if the IE "GANSS Carrier-Phase Measurement Requested" is included with one bit set to value one for a supported GANSS:

7> include the IE "Carrier Quality Indication" and include the IE "ADR".

5> if the UE supports the capability to perform GANSS measurements on multiple GANSS frequencies:

6> if the IE "GANSS Multi-frequency Measurement Requested" is included with one bit set to value one for a supported GANSS, and if any of these GANSS signals are measured:

7> include the IE "GANSS Signal Measurement Information" for each measured GANSS signal.

8) 1> if the UE is unable to report the requested measurement results due to missing GPS assistance data:

2> the UE may at anytime send a measurement report containing the IE "UE positioning error" and set the contents of this IE as specified in subclause 8.6.7.19.5.

2> after sending the measurement report, the UE shall not send another measurement report to request the same GPS assistance data for at least 20s. This requirement does not apply after release of the current RRC connection.

1> if the UE is unable to report the requested measurement results due to missing GANSS assistance data:

2> the UE may at anytime send a measurement report containing the IE "UE positioning error" and set the contents of this IE as specified in subclause 8.6.7.19.5;

2> after sending the measurement report, the UE shall not send another measurement report to request the same GANSS assistance data for at least 20s. This requirement does not apply after release of the current RRC connection.

9) The UE shall set the contents of the IE "UE positioning Error" as follows:

…

1> if the IE "Positioning Methods" in IE "UE positioning reporting quantity" has been assigned to value "GPS" and the IE "GANSS Positioning Methods" is present:

2> if there were not enough GANSS satellites to be received:

3> set IE "Error reason" to "Not Enough GANSS Satellites".

2> if some GANSS assistance data was missing:

3> set IE "Error reason" to "Assistance Data Missing"; and

3> if the IE "Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to TRUE:

4> include the IE "GANSS Additional Assistance Data Request".

3> if the IE "Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to FALSE:

4> not include the IE "GANSS Additional Assistance Data Request", and use the assistance data available for doing a positioning estimate.

Reference(s):

- Conformance requirement 1: TS 25.331, subclause 8.4.1.3.
- Conformance requirement 2: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4.
- Conformance requirement 3: TS 25.331, subclause 8.6.7.19.7.4
- Conformance requirement 4: TS 25.331, subclause 8.6.7.19.7.4a
- Conformance requirement 5: TS 25.331, subclause 8.6.7.19.7.4b
- Conformance requirement 6: TS 25.331, subclause 8.6.7.19.1b
- Conformance requirement 7: TS 25.331, subclause 8.6.7.19.1a
- Conformance requirement 8: TS 25.331, subclause 8.6.7.19.1a, 8.6.7.19.1b
- Conformance requirement 9: TS 25.331, subclause 8.6.7.19.5

6.2.3.1.3 Test Purpose

To verify the UE's behaviour in a mobile-terminated location request procedure using UE-based or UE-assisted A-GNSS with assistance data from the network.

To verify that the UE in CELL_DCH state accepts assistance data received in multiple MEASUREMENT CONTROL messages.

To verify that the UE includes the IE "GPS Additional Assistance Data Request" or "GANSS Additional Assistance Data Request" to request assistance data when it does not have enough assistance data.

6.2.3.1.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signals: As specified in 4.2.
- User Equipment (UE):
  - The UE is in state "MM idle" with valid TMSI and CKSN.
  - The UE is in state "PMM idle" with valid P-TMSI.
  - The UE shall begin the test with no GPS and GANSS assistance data stored.

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.

- UE Assisted Network Assisted GANSS
- UE Based Network Assisted GPS (Sub-tests 3. 4, 8 and 10).
- UE Assisted Network Assisted GPS (Sub-tests 3, 4, 8 and 10).
- Method of clearing stored GPS/GANSS assistance data.

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: “A-GPS” includes Modernized GPS if supported by the UE.	

The stored GPS/GANSS assistance data in the UE shall be cleared.

The SS initiates authentication and ciphering and orders a positioning measurement using a MEASUREMENT CONTROL message including no assistance data.
The UE sends a MEASUREMENT REPORT message to report a positioning error, requesting further assistance data.
The SS response with one or more MEASUREMENT CONTROL messages that include the requested assistance data and instructs the UE not to repeat the request for assistance data. The final MEASUREMENT CONTROL message orders periodic reporting.

The UE performs positioning measurements and responds with a MEASUREMENT REPORT message including the IE "UE Positioning Position Estimate Info" in case of UE-based, or including the IE "UE positioning GANSS measured results" and/or "UE positioning GPS measured results" in case of UE-assisted.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<-		AUTHENTICATION REQUEST	
2	->		AUTHENTICATION RESPONSE	
3	SS			The SS starts ciphering and integrity protection.
4			Void	
5			Void	
6			Void	
7	<--		MEASUREMENT CONTROL	No assistance data, and "Additional Assistance Data Request" IE set to TRUE.
8	->		MEASUREMENT REPORT	Positioning error report ‘Assistance Data Missing’
9	<-		MEASUREMENT CONTROL	The SS provides the requested data in one or more MEASUREMENT CONTROL messages. The last message contains: Reporting mode: Periodical reporting Amount of reporting: 1 Reporting interval: 64000
10	-->		MEASUREMENT REPORT	Measurement report message containing UE position estimate (UE-based), or IE "UE positioning GANSS measured results" and/or "UE positioning GPS measured results’’ (UE-assisted).
11	SS			The SS releases the RRC connection and the test case ends.

Specific Message Contents

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based or UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	TRUE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	UE assisted: Set according to UE capabilities UE based: Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- No reporting	
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for "Inadequate assistance data for UE-based A-GNSS" in 4.4.2 or "Inadequate assistance data for UE-assisted A-GNSS" in 4.4.4
- UE positioning GANSS assistance data	Set as specified for "Inadequate assistance data for UE-based A-GNSS" in 4.4.2 or "Inadequate assistance data for UE-assisted A-GNSS" in 4.4.4
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
- Error reason	Assistance Data Missing
-GPS additional assistance data requested	Sub-tests 3, 4, 8 and 10
-Almanac	Present, if requested by UE
-UTC model	Present, if requested by UE
-Ionospheric model	Present, if requested by UE
-Navigation model	Present, if requested by UE
-DGPS corrections	Present, if requested by UE
-Reference location	Present, if requested by UE
-Reference time	Present, if requested by UE
-Acquisition assistance	Present, if requested by UE
-Real-time integrity	Present, if requested by UE
-Navigation model additional data	Present, if requested by UE
-GANSS additional assistance data requested	Sub-tests 1, 2, 4, 9
-GANSS Reference time	Present, if requested by UE
-Reference location	Present, if requested by UE
-GANSS Ionospheric model	Present, if requested by UE
-GANSS Additional Ionospheric Model for Data ID = ‘00’	Present, if requested by UE
-GANSS Additional Ionospheric Model for Data ID = ‘11’	Present, if requested by UE
-GANSS Earth orientation parameters	Present, if requested by UE
-GANSS Real-time integrity	Present, if requested by UE
-GANSS Almanac	Present, if requested by UE
-GANSS Time Model	Present, if requested by UE
-GANSS Ephemeris Extension Check	Present, if requested by UE
- UE positioning GANSS measured results	Not present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

MEASUREMENT CONTROL (Step 9)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE *Measurement type*	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based or UE assisted
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-test 1: bit 5 = 1 Sub-test 2: bit 1 = 1 Sub-test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	UE assisted: Set according to UE capabilities UE based: Not present
- Measurement validity	
- UE state	All states
- CHOICE *Reporting criteria*	Set as required according to position in sequence of messages
- Periodical reporting criteria	Set as required according to position in sequence of messages
- Amount of reporting	Set as required according to position in sequence of messages
- Reporting interval	Set as required according to position in sequence of messages
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified in 4.4.5
- UE positioning GANSS assistance data	Set as specified in 4.4.5
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 10)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE *Measurement*	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	
-CHOICE Position estimate	One of 'Ellipsoid point with uncertainty Circle' or 'Ellipsoid point with uncertainty Ellipse' or 'Ellipsoid point with altitude and uncertainty Ellipsoid' (UE-based)
- UE positioning GPS measured results	Present for UE-assisted (Sub-Tests 3, 4, 8 and 10)
- UE positioning error	Not present
- UE positioning GANSS measured results	Present for UE-assisted.
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

6.2.3.1.5 Test requirements

After step 7 the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning error", with "Error reason" set to "Assistance Data Missing".

After step 9 the UE shall send a MEASUREMENT REPORT message containing a valid UE position estimate (UE-based) or GANSS and/or GPS measurements (UE-assisted).

6.2.3.2 MT-LR Position Estimate: UE-Based A-GNSS – Failure Not Enough Satellites

6.2.3.2.1 Definition

This test case applies to all UEs supporting UE-Based GANSS or GNSS Location Service capabilities.

6.2.3.2.2 Conformance requirements

1) if the IE "Measurement command" has the value "modify":

   2> for all IEs present in the MEASUREMENT CONTROL message:

      3> if a measurement was stored in the variable MEASUREMENT_IDENTITY associated to the identity by the IE "measurement identity":

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GPS assistance data" is present, for any of the optional IEs "UE positioning GPS reference time", "UE positioning GPS reference UE position", "UE positioning GPS DGPS corrections", "UE positioning GPS ionospheric model", "UE positioning GPS UTC model", "UE positioning GPS acquisition assistance", "UE positioning GPS real-time integrity" that are present in the MEASUREMENT CONTROL message:

         4> if measurement type is set to "UE positioning measurement" and the IE "UE positioning GANSS assistance data" is present, for any of the optional IEs "UE positioning GANSS reference time", "UE positioning GANSS reference UE position", "UE positioning DGANSS corrections", "UE positioning

GANSS ionospheric model", "UE positioning GANSS additional ionospheric model", "UE positioning GANSS UTC model", "UE positioning GANSS additional UTC models", "UE positioning GANSS reference measurement information", "UE positioning GANSS data bit assistance", "UE positioning GANSS Time model", "UE positioning GANSS real-time integrity", "UE positioning GANSS Earth orientation parameters", "UE positioning GANSS auxiliary information" that are present in the MEASUREMENT CONTROL message:

5> replace all instances of the IEs listed above (and all their children) stored in variable MEASUREMENT_IDENTITY associated to the identity indicated by the IE "measurement identity" with the IEs received in the MEASUREMENT CONTROL message;

5> leave all other stored information elements unchanged in the variable MEASUREMENT_IDENTITY.

2) If the IE "UE positioning GPS Navigation Model" is included, for each satellite, the UE shall:

1> use IE "Satellite Status" to determine if an update of IE "UE positioning GPS Ephemeris and Clock Correction parameters" has been provided for the satellite indicated by the IE "SatID";

1> if an update has been provided for this satellite:

2> act as specified in subclause 8.6.7.19.3.4.

If the IE "UE positioning GPS Ephemeris and Clock Correction parameters" is included, for each satellite, the UE shall:

1> update the variable UE_POSITIONING_GPS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GPS Navigation Model" in the variable UE_POSITIONING_GPS_DATA, possibly overwriting any existing information in this position.

1> act on these GPS ephemeris and clock correction parameters in a manner similar to that specified in [12].

3) If the IE "UE positioning GANSS Navigation Model" is included, the UE shall:

1> for each GANSS:

2> for each satellite, the UE shall:

3> for IE "UE positioning GANSS clock model":

4> act as specified in subclause 8.6.7.19.7.4a.

3> for IE "UE positioning GANSS orbit model":

4> act as specified in subclause 8.6.7.19.7.4b.

4) If the IE "UE positioning GANSS clock model" is included, the UE shall:

1> for each GANSS:

2> update the variable UE_POSITIONING_GANSS_DATA as follows:

3> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GANSS Navigation Model" in the variable UE_POSITIONING_GANSS_DATA, possibly overwriting any existing information in this position.

2> act on these GANSS clock models in a manner similar to that specified in a relevant ICD.

5) If the IE "UE positioning GANSS orbit model" is included, for each satellite of each supported GNSS, the UE shall:

1> update the variable UE_POSITIONING_GANSS_DATA as follows:

2> store this IE at the position indicated by the IE "Sat ID" in the IE "UE positioning GANSS Navigation Model" in the variable UE_POSITIONING_GANSS_DATA, possibly overwriting any existing information in this position..

1> act on these GANSS orbit models in a manner similar to that specified in a relevant ICD.

6) The UE shall when a measurement report is triggered:

2> if the UE has been able to calculate a position after performing measurements on the cells included in the variable UE_POSITIONING_OTDOA_DATA_UE_BASED in case of OTDOA or the UE has been able to calculate a position in case of GPS or GANSS positioning or the UE has been able to calculate a position using a standalone positioning method:

3> include IE "UE positioning Position Estimate Info" in the MEASUREMENT REPORT and set the contents of the IE as follows:

4> if the UE supports the capability to perform the UE GPS timing of cell frames measurement:

5> if the IE "GPS timing of Cell wanted" is set to TRUE:

6> perform the UE GPS timing of cell frames measurement on the serving cell or on one cell of the active set.

6> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD;

6> include the SFN when the position was determined;

6> include the IE "UE GPS timing of cell frames";

6> include the IE "UE Positioning GPS Reference Time Uncertainty".

5> if the IE "GPS timing of Cell wanted" is set to FALSE:

6> include the IE "GPS TOW msec" and set it to the GPS TOW when the position estimate was valid.

4> if the position was calculated with GPS; and

4> the UE does not support the capability to provide the GPS timing of the cell:

5> include the IE "GPS TOW msec" and set it to the GPS TOW when the position estimate was valid.

4> if the UE supports the capability to provide the GANSS timing of the cell frames measurement:

5> if the IE "GANSS timing of Cell wanted" is included with one bit set to value one for a supported GANSS:

6> perform the UE GANSS timing of cell frames measurement on the serving cell or on one cell of the active set;

6> include the IE "GANSS Time ID" to identify the GNSS system time;

6> include the IE "Primary CPICH Info" for FDD or the IE "cell parameters id" for TDD; and

6> include the IE "Reference SFN" and the IE "UE GANSS timing of cell frames".

5> if the IE "GANSS timing of Cell wanted" is not included, or included with each bit set to value zero:

6> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid.

4> if the UE does not support the capability to provide the GANSS timing of the cell:

5> include the IE "GANSS TOD msec" and set it to the GANSS TOD when the position estimate was valid;

5> include the IE "GANSS Time ID" to identify the GNSS system time.

4> if IE "Vertical Accuracy" has been included in IE "UE positioning reporting quantity":

5> if the IE "Vertical Accuracy" has been assigned to value "0":

6> if the IE "Horizontal Accuracy" has been assigned a value "0":

7> may include IE "Ellipsoid point with altitude".

6> if the IE "Horizontal Accuracy" has been assigned a value unequal to "0"; and

6> if the UE has been able to calculate a 3-dimensional position

7> include IE "Ellipsoid point with altitude" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> may act as if IE "Vertical Accuracy" was not included in IE "UE positioning reporting quantity".

5> if the IE "Vertical Accuracy" has been assigned to a value unequal to "0":

6> if the UE has been able to calculate a 3-dimensional position:

7> include IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

6> if the UE has not been able to calculate a 3-dimensional position:

7> act as if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity".

4> if IE "Vertical Accuracy" has not been included in IE "UE positioning reporting quantity":

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to value "0":

6> may include IE "Ellipsoid point".

5> if IE "Horizontal Accuracy" in IE "UE positioning reporting quantity" has been assigned to a value unequal to 0:

6> include either IE "Ellipsoid point with uncertainty circle" or IE "Ellipsoid point with uncertainty ellipse" or IE "Ellipsoid point with altitude and uncertainty ellipsoid" as the position estimate.

4> if any of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" is reported:

5> should calculate a value of the IE "Confidence", different from "0", as the probability that the UE is located within the uncertainty region of the one of the IEs "Ellipsoid point with uncertainty ellipse" or "Ellipsoid point with altitude and uncertainty ellipsoid" that is reported.

NOTE: The value "0" of the IE "Confidence" is interpreted as "no information" by the UTRAN [57].

4> if IE "Velocity Requested" has been included in IE "UE positioning reporting quantity":

5> include IE "Velocity estimate" if supported and available.

2> if the UE was not able to calculate a position:

3> include IE "UE positioning error" in the MEASUREMENT REPORT and set the contents of this IE as specified in subclause 8.6.7.19.5.

7) The UE shall set the contents of the IE "UE positioning Error" as follows:

…

1> if the IE "Positioning Methods" in IE "UE positioning reporting quantity" has been assigned to value "GPS" and the IE "GANSS Positioning Methods" is present:

2> if there were not enough GANSS satellites to be received:

3> set IE "Error reason" to "Not Enough GANSS Satellites".

2> if some GANSS assistance data was missing:

3> set IE "Error reason" to "Assistance Data Missing"; and

3> if the IE "Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to TRUE:

4> include the IE "GANSS Additional Assistance Data Request".

3> if the IE "Additional Assistance Data Request" included in the IE "UE positioning reporting quantity" stored in the variable MEASUREMENT_IDENTITY is set to FALSE:

4> not include the IE "GANSS Additional Assistance Data Request", and use the assistance data available for doing a positioning estimate.

Reference(s):

- Conformance requirement 1: TS 25.331, subclause 8.4.1.3.
- Conformance requirement 2: TS 25.331, subclauses 8.6.7.19.3.3a, 8.6.7.19.3.4.
- Conformance requirement 3: TS 25.331, subclause 8.6.7.19.7.4
- Conformance requirement 4: TS 25.331, subclause 8.6..7.19.4a
- Conformance requirement 5: TS 25.331, subclause 8.6.7.19.4b
- Conformance requirement 6: TS 25.331, subclause 8.6.7.19.1b
- Conformance requirement 7: TS 25.331, subclause 8.6.7.19.5

6.2.3.2.3 Test Purpose

To verify the UE behaviour at a mobile terminated location request procedure using network-assisted UE-based GNSS when the MT-LR procedure fails due to failure of positioning method.

To verify that the UE in CELL_DCH state accepts assistance data received in multiple MEASUREMENT CONTROL messages.

To verify that the UE sets the IE Error Reason in ‘UE Positioning Error’ to ‘Not Enough GANSS Satellites’ when it does not receive enough satellite signals to compute a position.

6.2.3.2.4 Method of Test

Initial Conditions

- System Simulator (SS):
  - 1 cell, default parameters.
  - Satellite signals switched off or not present.
- User Equipment (UE):
  - State “CS-CELL DCH Initial (State 6-1) ” as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Based Network Assisted GPS (Sub-tests 3, 4, 8 and 10).

Test Procedure

This test case includes sub-test cases dependent on the GNSS supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined below:

Sub-Test Case Number	Supported GNSS
1	UE supporting A-GLONASS only
2	UE supporting A-Galileo only
3	UE supporting A-GPS and Modernized GPS only
4	UE supporting A-GPS(1) and A-GLONASS only
8	UE supporting A-GPS(1) and A-Galileo only
9	UE supporting A-BDS only
10	UE supporting A-GPS(1) and A-BDS only
NOTE 1: “A-GPS” includes Modernized GPS if supported by the UE.	

The SS initiates authentication and ciphering and orders an A-GNSS positioning measurement using one or more (dependent on the sub-test) MEASUREMENT CONTROL messages.

The UE sends a MEASUREMENT REPORT message reporting a positioning error for not enough satellite signal.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<-		AUTHENTICATION REQUEST	
2	->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4			Void	
5			Void	
6			Void	
7	<--		MEASUREMENT CONTROL	All Sub-Tests
7a	<--		MEASUREMENT CONTROL	Sub-Tests 2, 3, 4, 8, 10 only
7b	<--		MEASUREMENT CONTROL	Sub-Tests 4, 8, 10 only
8	->		MEASUREMENT REPORT	Positioning error report ‘not enough satellites’
9	SS			The SS releases the RRC connection and the test case ends.

Specific Message Contents

MEASUREMENT CONTROL (Step 7):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Setup
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE Measurement type	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 1: bit 5 = 1 Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE Reporting criteria	
- Periodical reporting criteria	For Sub-Tests 1, 9 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 2, 3, 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the first MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 7a):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE Measurement type	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 2: bit 1 = 1 Sub-Test 3: bit 0 and 3 = 1 Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 9: bit 6 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE Reporting criteria	
- Periodical reporting criteria	For Sub-Tests 2, 3 only
- Amount of reporting	1
- Reporting interval	64000
- No reporting	For Sub-Tests 4, 8, 10 only
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the second MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT CONTROL (Step 7b):

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measurement Command	Modify
Measurement Reporting Mode	
- Measurement report transfer mode	Acknowledged mode RLC
- Periodical reporting / Event trigger reporting mode	Periodical reporting
Additional Measurements List	Not present
CHOICE Measurement type	UE positioning measurement
- UE positioning measurement	
- UE positioning reporting quantity	
- Method type	UE based
- Positioning methods	GPS
- Response time	128
- Horizontal accuracy	127
- Vertical accuracy	127
- GPS timing of cell wanted	FALSE
- Multiple sets	FALSE
- Additional assistance data request	FALSE
- Environmental characterization	Not present
- Velocity Requested	Not present
- GANSS Positioning Method	Sub-Test 4: bit 0 and 3 and 5 = 1 Sub-Test 8: bit 0 and 1 and 3 = 1 Sub-Test 10: bit 0 and 3 and 6 = 1
- GANSS timing of cell wanted	Not present
- GANSS Carrier-Phase Measurement Requested	Not present
- GANSS Multi-frequency Measurement Requested	Not present
- Measurement validity	
- UE state	All states
- CHOICE Reporting criteria	
- Periodical reporting criteria	
- Amount of reporting	1
- Reporting interval	64000
- UE pos OTDOA assistance data for UE-assisted	Not present
- UE pos OTDOA assistance data for UE-based	Not present
- UE positioning GPS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
- UE positioning GANSS assistance data	Set as specified for the third MEASUREMENT CONTROL message for "Adequate assistance data for UE-based A-GNSS" in 4.4.1
Physical Channel Information Elements	
DPCH compressed mode status info	Not present

MEASUREMENT REPORT (Step 8)

Information element	Value/remark
Measurement Information Elements	
Measurement Identity	10
Measured Results	
- CHOICE Measurement	UE positioning measured results
- UE positioning measured results	
- UE positioning OTDOA measured results	Not present
- UE positioning position estimate info	Not present
- UE positioning GPS measured results	Not present
- UE positioning error	Not present
- Error reason	notEnoughGANSS-Satellites or notEnoughGPS-Satellites (sub-tests 3, 4, 8 and 10 only)
- UE positioning GANSS measured results	Not present
Measured Results on secondary UL frequency	Not present
Measured Results on RACH	Not present
Additional Measured Results	Not present
Additional Measured results on secondary UL frequency	Not present
Event Results	Not present
Event results on secondary UL frequency	Not present
Inter-RAT cell info indication	Not present
E-UTRA Measured Results	Not present
E-UTRA Event Results	Not present
CSG Proximity Indication	Not present

6.2.3.2.5 Test requirements

After step 7 the UE shall send a MEASUREMENT REPORT message containing the IE "UE positioning error", with "Error reason" set to "Not Enough Satellites".

6.2.3.3 Location Notification

6.2.3.3.1 Definition

This test case applies to all UEs supporting UE-Based or UE-Assisted GANSS or GNSS Location Service capabilities and LCS value added location request notification capability.

6.2.3.3.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

In the case of location notification no response is required from the UE, the UE shall terminate the dialogue by sending a RELEASE COMPLETE message containing a LocationNotification return result.

References

- Conformance requirement 1: TS 24.030, clause 4.1.1

6.2.3.3.3 Test Purpose

To verify that when the UE receives a REGISTER message during an established CS call, containing a LCS Location Notification Invoke component set to NotifyLocationAllowed, the UE notifies the UE user of the location request and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

6.2.3.3.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals switched off or not present

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Assisted Network Assisted GANSS.
- UE supporting LCS value added location request notification capability.

Test Procedure

The SS initiates authentication and ciphering and sends an SS REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyLocationAllowed. The UE notifies the UE user of the location request. The UE then responds with a RELEASE COMPLETE message containing a LocationNotification return result to terminate the dialogue.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<-		AUTHENTICATION REQUEST	
2	->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyLocationAllowed
5	UE			The UE notifies the UE user of the location request
6	->		RELEASE COMPLETE	The UE terminates the dialogue
7	SS			SS releases the RRC connection and the test case ends

Specific Message Contents

REGISTER (Step 4)

Information element	Value/remark
Protocol Discriminator Transaction identifier Message type Facility	Call Independent SS message (1011) REGISTER (0011 1011) Invoke = lcs-LocationNotification LocationNotificationArg notificationType -> notifyLocationAllowed, locationType -> current Location , lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 6)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = lcs-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

6.2.3.3.5 Test requirements

After step 4 the UE shall notify the UE user of the location request.

After step 5 the UE shall send a RELEASE COMPLETE message.

6.2.3.4 Privacy Verification - Location Allowed if No Response

6.2.3.4.1 Definition

This test case applies to all UEs supporting UE-Based or UE-Assisted GANSS or GNSS Location Service capabilities and LCS value added location request notification capability.

6.2.3.4.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

2) In case of privacy verification the MS shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

3) If the timer expires in the network before any response from the MS (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in GSM 03.71 for GSM and TS 23.171 for UMTS (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

References

- Conformance requirement 1, 2 and 3: TS 24.030, clause 4.1.1

6.2.3.4.3 Test Purpose

To verify that when the UE receives a REGISTER message, containing a LCS Location Notification Invoke component set to notifyAndVerify-LocationAllowedIfNoResponse, the UE notifies the UE user of the location request and indicates that the default response is location allowed if no response and providing the opportunity to accept or deny the request and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied or permissionGranted as appropriate.

6.2.3.4.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters

- Satellite signals switched off or not present

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Assisted Network Assisted GANSS.
- UE supporting LCS value added location request notification capability.
- px_UeLcsNotification: value for UE LCS Notification timeout timer.

Test Procedure

The SS initiates authentication and ciphering and sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The UE notifies the UE user of the location request with the option to accept or deny the request and an indication that location will be allowed if no user response is received.

The user accepts the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The UE notifies the UE user of the location request with the option to accept or deny the request and an indication that location will be allowed if no user response is received.

The user denies the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse.

The UE notifies the UE user of the location request with the option to accept or deny the request and an indication that location will be allowed if no user response is received.

The user ignores the location request by taking no action, allowing the verification process to time-out.

The SS send a RELEASE COMPLETE.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
5	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
6	UE			The UE notifies the UE user of the location request and indicates to the user that location will be allowed in the absence of a response
7	UE			The user accepts the location request before timer T(LCSN) expires
8	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionGranted
9	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
10	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
11	UE			The UE notifies the UE user of the location request and indicates to the user that location will be allowed in the absence of a response
12	UE			The user denies the location request before timer T(LCSN) expires
13	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionDenied
14	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationAllowedIfNoResponse
15	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
16	UE			The UE notifies the UE user of the location request and indicates to the user that location will be allowed in the absence of a response
17	UE			The user does not reply
18	SS			SS waits until T(LCSN) expires to ensure that the UE does not send a RELEASE COMPLETE message.
19	<-		RELEASE COMPLETE	SS terminates the dialogue
20	SS			SS releases the connection and the test case ends

Specific Message Contents

REGISTER (Steps 4, 9 and 14)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 8)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

RELEASE COMPLETE (Step 13)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionDenied

RELEASE COMPLETE (Step 19)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)

6.2.3.4.5 Test requirements

After steps 4, 9 and 14 the UE shall notify the UE user of the location request and indicate to the user that location will be allowed in the absence of a response.

After step 7 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionGranted.

After step 12 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionDenied.

During step 18 the UE shall not send any RELEASE COMPLETE message.

6.2.3.5 Privacy Verification - Location Not Allowed if No Response

6.2.3.5.1 Definition

This test case applies to all UEs supporting UE-Based or UE-Assisted GANSS or GNSS Location Service capabilities and LCS value added location request notification capability.

6.2.3.5.2 Conformance requirements

1) The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

2) In case of privacy verification the MS shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

3) If the timer expires in the network before any response from the MS (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in GSM 03.71 for GSM and TS 23.171 for UMTS (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

References

- Conformance requirement 1, 2 and 3: TS 24.030, clause 4.1.1

6.2.3.5.3 Test Purpose

To verify that when the UE receives a REGISTER message, containing a LCS Location Notification Invoke component set to notifyAndVerify-LocationNotAllowedIfNoResponse, the UE notifies the UE user of the location request and indicates that the default response is location not allowed if no response and providing the opportunity to accept or deny the request and sends a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied or permissionGranted as appropriate.

6.2.3.5.4 Method of Test

Initial Conditions

System Simulator (SS):

- 1 cell, default parameters
- Satellite signals switched off or not present

UE:

- State "CS-CELL DCH Initial (State 6-1)" as specified in clause 7.4.1 of TS 34.108.

Related PICS/PIXIT Statements

- UE Based Network Assisted GANSS.
- UE Assisted Network Assisted GANSS.
- UE supporting LCS value added location request notification capability.
- px_UeLcsNotification: value for UE LCS Notification timeout timer.

Test Procedure

The SS initiates authentication and ciphering and sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The UE notifies the UE user of the location request with the option to accept or deny the request and an indication that location will be not allowed if no user response is received.

The user accepts the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionGranted.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The UE notifies the UE user of the location request with the option to accept or deny the request and an indication that location will be not allowed if no user response is received.

The user denies the location request. The UE responds with a RELEASE COMPLETE message containing a LocationNotification return result with verificationResponse set to permissionDenied.

The SS sends a REGISTER message containing a Facility IE containing a LCS Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse.

The UE notifies the UE user of the location request with the option to accept or deny the request and an indication that location will be not allowed if no user response is received.

The user ignores the location request by taking no action, allowing the verification process to time-out.

The SS send a RELEASE COMPLETE.

Expected Sequence

Step	Direction		Message	Comments
	UE	SS		
1	<--		AUTHENTICATION REQUEST	
2	-->		AUTHENTICATION RESPONSE	
3	SS			SS starts security procedure
4	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
5	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
6	UE			The UE notifies the UE user of the location request and indicates to the user that location will be not allowed in the absence of a response
7	UE			The user accepts the location request before timer T(LCSN) expires
8	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionGranted
9	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
10	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
11	UE			The UE notifies the UE user of the location request and indicates to the user that location will be not allowed in the absence of a response
12	UE			The user denies the location request before timer T(LCSN) expires
13	->		RELEASE COMPLETE	Containing a LocationNotification return result with verificationResponse set to permissionDenied
14	<-		REGISTER	Call Independent SS containing Facility IE Location Notification Invoke message set to notifyAndVerify-LocationNotAllowedIfNoResponse
15	SS			SS starts timer T(LCSN) set to 90% of px_UeLcsNotification
16	UE			The UE notifies the UE user of the location request and indicates to the user that location will be not allowed in the absence of a response
17	UE			The user does not reply
18	SS			SS waits until T(LCSN) expires to verify that the UE does not send a RELEASE COMPLETE message.
19	<-		RELEASE COMPLETE	SS terminates the dialogue
20	SS			SS releases the connection and the test case ends

Specific Message Contents

REGISTER (Steps 4, 9 and 14)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	REGISTER (0011 1011)
Facility	Invoke = LCS-LocationNotification LocationNotificationArg notificationType -> notifyAndVerify-LocationNotAllowedIfNoResponse locationType -> current Location lcsClientExternalID -> externalAddress lcsClientName ->dataCodingScheme nameString

RELEASE COMPLETE (Step 8)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionGranted

RELEASE COMPLETE (Step 13)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (xx10 1010)
Facility	Return result = LCS-LocationNotification LocationNotificationRes verificationResponse -> permissionDenied

RELEASE COMPLETE (Step 19)

Information element	Value/remark
Protocol Discriminator	Call Independent SS message (1011)
Transaction identifier	
Message type	RELEASE COMPLETE (0010 1010)

6.2.3.5.5 Test requirements

After steps 4, 9 and 14 the UE shall notify the UE user of the location request and indicate to the user that location will be not allowed in the absence of a response.

After step 7 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionGranted.

After step 12 the UE shall send a RELEASE COMPLETE message with verificationResponse set to permissionDenied.

During step 18 the UE shall not send any RELEASE COMPLETE message.

7 Protocol Conformance Test Cases for E-UTRAN

7.1 NAS Protocol Procedures

7.1.1 UE Network Capability

7.1.1.1 Test Purpose (TP)

(1)

```
with { the UE having received an RRCConnectionSetup message. }
ensure that {
  when {    the UE transmits ATTACH REQUEST }
    then {  the UE correctly sets UE Network Capability IE values for LCS and LPP }
            }
```

7.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171 clause 4.2.1 and TS 24.301 clause 9.9.3.3.

[TS 24.171, clause 4.2.1]

The UE announces to the network its ability to support LCS notification mechanism and/or LPP messages using the UE Network Capability IE defined in 3GPP TS 24.301.

[TS 24.301, clause 9.9.3.3]

The purpose of the UE network capability information element is to provide the network with information concerning aspects of the UE related to EPS or interworking with GPRS. The contents might affect the manner in which the network handles the operation of the UE. The UE network capability information indicates general UE characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

…

7.1.1.3 Test description

7.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals switched off or not present

UE:

-

Preamble:

- the UE is in state Switched OFF (state 1) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

-

7.1.1.3.2 Test procedure sequence

Table 7.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1		<--	RRC: SYSTEM INFORMATION (BCCH)	-	-
1a	UE is switched on.				
2	UE transmits an *RRCConnectionRequest* message.	-->	RRC: *RRCConnectionRequest*	-	-
3	SS transmits an *RRCConnectionSetup* message.	<--	RRC: *RRCConnectionSetup*	-	-
4	The UE transmits an *RRCConnectionSetupComplete* message to confirm the successful completion of the connection establishment and to initiate the Attach procedure by including the ATTACH REQUEST message. The PDN CONNECTIVITY REQUEST message is piggybacked in ATTACH REQUEST	-->	RRC: *RRCConnectionSetupComplete* NAS: ATTACH REQUEST NAS: PDN CONNECTIVITY REQUEST	1	P
5 to 17	Steps 5 to 17 of the registration procedure described in TS 36.508 subclause 4.5.2.3 are performed. NOTE: The UE performs registration and the RRC connection is released.				

7.1.1.3.3 Specific message contents

Table 7.1.1.3.3-1: ATTACH REQUEST (step 4, Table 7.1.1.3.2-1)

Derivation Path: 24.301 clause 8.2.4			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	EMM		
Security header type	'0000'B	Plain NAS message, not security protected	
Attach request message identity	'0100 0001'B	Attach request	
EPS attach type	'0001'B	EPS attach	EPS_only
	'0010'B	combined EPS/IMSI attach	combined_EPS_IMSI
NAS key set identifier	Any allowed value		
Old GUTI or IMSI	Any allowed value		
UE network capability	Set according to Table 7.1.1.3.3-2		
ESM message container	PDN CONNECTIVITY REQUEST message to request PDN connectivity to the default PDN		
Old P-TMSI signature	Not present or any allowed value		
Additional GUTI	Not present or any allowed value		
Last visited registered TAI	Not present or any allowed value		
DRX parameter	Not present or any allowed value		
MS network capability	Not present or any allowed value		
Old location area identification	Not present or any allowed value		
TMSI status	Not present or any allowed value		
Mobile station classmark 2	Not present or any allowed value		
Mobile station classmark 3	Not present or any allowed value		
Supported Codecs	Not present or any allowed value		
Additional update type	Not present		EPS_only
Additional update type	Not present or any allowed value		combined_EPS_IMSI

Condition	**Explanation**
EPS_only	See the definition below table 4.7.2-1 in TS 36.508.
combined_EPS_IMSI	See the definition below table 4.7.2-1 in TS 36.508.

NOTE: This message is sent integrity protected when a valid security context exists and without integrity protection otherwise.

Table 7.1.1.3.3-2: UE network capability (step 4, Table 7.1.1.3.2-1)

Derivation Path: 24.301 clause 9.9.3.34			
Information Element Contents	**Value/remark**	**Comment**	**Condition**
Octet 7, bit 3	Set according to pc_MT_LR_loc_notif	Location services (LCS) notification mechanisms capability	
Octet 7, bit 4	1 (LPP supported)	LTE Positioning Protocol (LPP) capability	
All other octets/bits	Any allowed value		

7.2 LCS Procedures

7.2.1 Location Notification and Privacy Verification

7.2.1.1 Location Notification

7.2.1.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when {    UE receives a REGISTER message containing the LCS-LocationNotification Invoke component
            set to NotifyLocationAllowed }
    then {  UE notifies the user of the location procedure and terminates the dialogue by sending a
            RELEASE COMPLETE message }
            }
```

7.2.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.1.1.1.

[TS 24.171, clause 5.2.1.1.1]

The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

…

In the case of location notification no response is required from the UE, the UE shall terminate the dialogue by sending a RELEASE COMPLETE message containing a LocationNotification return result.

…

7.2.1.1.3 Test description

7.2.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- UE supporting LCS value added location request notification capability.

7.2.1.1.3.2 Test procedure sequence

Table 7.2.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	*DLInformationTransfer* (REGISTER)	-	-
2	The UE notifies the user of the location procedure			1	P
3	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	*ULInformationTransfer* (RELEASE COMPLETE)	1	P

7.2.1.1.3.3 Specific message contents

Table 7.2.1.1.3.3-1: *DLInformationTransfer* (step 1, Table 7.2.1.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.1.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (step 1, Table 7.2.1.1.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	Set according to Table 7.2.1.1.3.3-3	REGISTER	
Additional information	Not present.		

Table 7.2.1.1.3.3-3: REGISTER (step 1, Table 7.2.1.1.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	0011 1011	REGISTER	
Facility	Invoke = lcs-LocationNotification	Set according to Table 7.2.1.1.3.3-4	

Table 7.2.1.1.3.3-4: LCS-LocationNotification (step 1, Table 7.2.1.1.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationArg ::= SEQUENCE {			
notificationType	notifyLocationAllowed		
locationType	currentLocation		
lcsClientExternalID SEQUENCE {			
externalAddress	ISDN-AddressString		
}			
lcsClientName SEQUENCE {			
dataCodingScheme	USSD-DataCodingScheme		
nameString	NameString		
}			
}			

Table 7.2.1.1.3.3-5: *ULInformationTransfer* (step 3, Table 7.2.1.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.1.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.1.1.3.3-6: UPLINK GENERIC NAS TRANSPORT (step 3, Table 7.2.1.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	Set according to Table 7.2.1.1.3.3-7	RELEASE COMPLETE	
Additional information	Not present		

Table 7.2.1.1.3.3-7: RELEASE COMPLETE (step 3, Table 7.2.1.1.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 7.2.1.1.3.3-8	

Table 7.2.1.1.3.3-8: LocationNotificationRes (step 3, Table 7.2.1.1.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionGranted		
}			

7.2.1.2 Privacy Verification – Location Allowed if no Response

7.2.1.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when {    UE receives a REGISTER message containing the LCS-LocationNotification Invoke component
            set to NotifyAndVerify-LocationAllowedIfNoResponse }
    then {  UE notifies the user of the location procedure and indicates that the default response
            is location allowed, allows the user to accept or deny the request and terminates the
            dialogue by sending a RELEASE COMPLETE message with verificationResponse set as
            appropriate }
            }
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
  when {    UE receives a REGISTER message containing the LCS-LocationNotification Invoke component
            set to NotifyAndVerify-LocationAllowedIfNoResponse }
    then {  UE notifies the user of the location procedure and indicates that the default response
            is location allowed, allows the user to accept or deny the request and waits for the
            user to respond }
            }
```

7.2.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.1.1.1.

[TS 24.171, clause 5.2.1.1.1]

The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

In case of privacy verification the UE shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

If the timer T(LCSN) expires in the network before any response from the UE (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in 3GPP TS 23.271 (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

…

7.2.1.2.3 Test description

7.2.1.2.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- UE supporting LCS value added location request notification capability.
- px_UeLcsNotification: value for UE LCS Notification timeout timer.

7.2.1.2.3.2 Test procedure sequence

Table 7.2.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	*DLInformationTransfer* (REGISTER)	-	-
2	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
3	The UE notifies the user of the location procedure and indicates that location will be allowed in the absence of a response			1	P
4	The user accepts the location request before timer T(LCSN) expires			-	-
5	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	*ULInformationTransfer* (RELEASE COMPLETE)	1	P
6	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	*DLInformationTransfer* (REGISTER)	-	-
7	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
8	The UE notifies the user of the location procedure and indicates that location will be allowed in the absence of a response			1	P
9	The user denies the location request before timer T(LCSN) expires			-	-
10	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	*ULInformationTransfer* (RELEASE COMPLETE)	1	P
11	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	*DLInformationTransfer* (REGISTER)	-	-
12	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
13	The UE notifies the user of the location procedure and indicates that location will be allowed in the absence of a response			2	P
14	The user does not reply			-	-
15	SS waits until T(LCSN) expires to ensure that the UE does not send a RELEASE COMPLETE message.			2	P
16	The SS terminates the dialogue by sending a RELEASE COMPLETE message.	<--	*DLInformationTransfer* (RELEASE COMPLETE)	-	-

7.2.1.2.3.3 Specific message contents

Table 7.2.1.2.3.3-1: *DLInformationTransfer* (steps 1, 6, 11 and 16, Table 7.2.1.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.2.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.1.2.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, 6, 11 and 16, Table 7.2.1.2.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	**Step 1, 6, 11:** Set according to Table 7.2.1.2.3.3-3	REGISTER	
	Step 16: Set according to Table 7.2.1.2.3.3-11	RELEASE COMPLETE	
Additional information	Not present.		

Table 7.2.1.2.3.3-3: REGISTER (steps 1, 6, and 11, Table 7.2.1.2.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	0011 1011	REGISTER	
Facility	Invoke = lcs-LocationNotification	Set according to Table 7.2.1.2.3.3-4	

Table 7.2.1.2.3.3-4: LCS-LocationNotification (step 1, 6 and 11, Table 7.2.1.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationArg ::= SEQUENCE {			
notificationType	notifyAndVerify-LocationAllowedIfNoResponse		
locationType	currentLocation		
lcsClientExternalID SEQUENCE {			
externalAddress	ISDN-AddressString		
}			
lcsClientName SEQUENCE {			
dataCodingScheme	USSD-DataCodingScheme		
nameString	NameString		
}			
}			

Table 7.2.1.2.3.3-5: *ULInformationTransfer* (steps 5 and 10, Table 7.2.1.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.2.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.1.2.3.3-6: UPLINK GENERIC NAS TRANSPORT (steps 5 and 10, Table 7.2.1.2.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	**Step 5:** Set according to Table 7.2.1.2.3.3-7	RELEASE COMPLETE	
	Step 10: Set according to Table 7.2.1.2.3.3-9	RELEASE COMPLETE	
Additional information	Not present		

Table 7.2.1.2.3.3-7: RELEASE COMPLETE (step 5, Table 7.2.1.2.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 7.2.1.2.3.3-8	

Table 7.2.1.2.3.3-8: LocationNotificationRes (step 5, Table 7.2.1.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionGranted		
}			

Table 7.2.1.2.3.3-9: RELEASE COMPLETE (step 10, Table 7.2.1.2.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 7.2.1.2.3.3-10	

Table 7.2.1.2.3.3-10: LocationNotificationRes (step 10, Table 7.2.1.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionDenied		
}			

Table 7.2.1.2.3.3-11: RELEASE COMPLETE (step 16, Table 7.2.1.2.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Cause	31 = Normal Unspecified	Set according to TS 24.008	

7.2.1.3 Privacy Verification – Location not Allowed if No Response

7.2.1.3.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when {    UE receives a REGISTER message containing the LCS-LocationNotification Invoke component
            set to NotifyAndVerify-LocationNotAllowedIfNoResponse }
    then {  UE notifies the user of the location procedure and indicates that the default response
            is location not allowed, allows the user to accept or deny the request and terminates
            the dialogue by sending a RELEASE COMPLETE message with verificationResponse set as
            appropriate }
            }
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
  when {    UE receives a REGISTER message containing the LCS-LocationNotification Invoke component
            set to NotifyAndVerify-LocationNotAllowedIfNoResponse }
    then {  UE notifies the user of the location procedure and indicates that the default response
            is location not allowed, allows the user to accept or deny the request and waits for the
            user to respond }
            }
```

7.2.1.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.1.1.1.

[TS 24.171, clause 5.2.1.1.1]

The network invokes a location notification procedure by sending a REGISTER message containing a LCS-LocationNotification invoke component to the UE. This may be sent either to request verification for MT-LR or to notify about already authorized MT-LR.

In case of privacy verification the UE shall respond to the request by sending a RELEASE COMPLETE message containing the mobile subscriber's response in a return result component.

If the timer T(LCSN) expires in the network before any response from the UE (e.g. due to no response from the user), the network shall interpret this by applying the default treatment defined in 3GPP TS 23.271 (i.e. disallow location if barred by subscription and allow location if allowed by subscription).

…

7.2.1.3.3 Test description

7.2.1.3.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- UE supporting LCS value added location request notification capability.

- px_UeLcsNotification: value for UE LCS Notification timeout timer.

7.2.1.3.3.2 Test procedure sequence

Table 7.2.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	*DLInformationTransfer* (REGISTER)	-	-
2	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
3	The UE notifies the user of the location procedure and indicates that location will be not allowed in the absence of a response			1	P
4	The user accepts the location request before timer T(LCSN) expires			-	-
5	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	*ULInformationTransfer* (RELEASE COMPLETE)	1	P
6	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	*DLInformationTransfer* (REGISTER)	-	-
7	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
8	The UE notifies the user of the location procedure and indicates that location will be not allowed in the absence of a response			1	P
9	The user denies the location request before timer T(LCSN) expires			-	-
10	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	*ULInformationTransfer* (RELEASE COMPLETE)	1	P
11	The SS sends a REGISTER message containing a LCS-LocationNotification Invoke component.	<--	*DLInformationTransfer* (REGISTER)	-	-
12	SS starts timer T(LCSN) set to 90% of px_UeLcsNotification			-	-
13	The UE notifies the user of the location procedure and indicates that location will be not allowed in the absence of a response			2	P
14	The user does not reply			-	-
15	SS waits until T(LCSN) expires to ensure that the UE does not send a RELEASE COMPLETE message.			2	P
16	The SS terminates the dialogue by sending a RELEASE COMPLETE message.	<--	*DLInformationTransfer* (RELEASE COMPLETE)	-	-

7.2.1.3.3.3 Specific message contents

Table 7.2.1.3.3.3-1: *DLInformationTransfer* (steps 1, 6, 11 and 16, Table 7.2.1.3.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.3.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.1.3.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, 6, 11 and 16, Table 7.2.1.3.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	**Step 1, 6, 11:** Set according to Table 7.2.1.3.3.3-3	REGISTER	
	Step 16: Set according to Table 7.2.1.3.3.3-11	RELEASE COMPLETE	
Additional information	Not present.		

Table 7.2.1.3.3.3-3: REGISTER (steps 1, 6, and 11, Table 7.2.1.3.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	0011 1011	REGISTER	
Facility	Invoke = lcs-LocationNotification	Set according to Table 7.2.1.3.3.3-4	

Table 7.2.1.3.3.3-4: LCS-LocationNotification (step 1, 6 and 11, Table 7.2.1.3.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationArg ::= SEQUENCE {			
notificationType	notifyAndVerify-LocationNotAllowedIfNoResponse		
locationType	currentLocation		
lcsClientExternalID SEQUENCE {			
externalAddress	ISDN-AddressString		
}			
lcsClientName SEQUENCE {			
dataCodingScheme	USSD-DataCodingScheme		
nameString	NameString		
}			
}			

Table 7.2.1.3.3.3-5: *ULInformationTransfer* (steps 5 and 10, Table 7.2.1.3.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.1.3.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.1.3.3.3-6: UPLINK GENERIC NAS TRANSPORT (steps 5 and 10, Table 7.2.1.3.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	**Step 5:** Set according to Table 7.2.1.3.3.3-7	RELEASE COMPLETE	
	Step 10: Set according to Table 7.2.1.3.3.3-9	RELEASE COMPLETE	
Additional information	Not present		

Table 7.2.1.3.3.3-7: RELEASE COMPLETE (step 5, Table 7.2.1.3.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 7.2.1.3.3.3-8	

Table 7.2.1.3.3.3-8: LocationNotificationRes (step 5, Table 7.2.1.3.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionGranted		
}			

Table 7.2.1.3.3.3-9: RELEASE COMPLETE (step 10, Table 7.2.1.3.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Facility	Return result = LocationNotificationRes	Set according to Table 7.2.1.3.3.3-10	

Table 7.2.1.3.3.3-10: LocationNotificationRes (step 10, Table 7.2.1.3.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LocationNotificationRes ::= SEQUENCE {			
verificationResponse	permissionDenied		
}			

Table 7.2.1.3.3.3-11: RELEASE COMPLETE (step 16, Table 7.2.1.3.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	
Cause	31 = Normal Unspecified	Set according to TS 24.008	

7.2.2 EPC MO-LR

7.2.2.1 Autonomous Self Location: UE-based

7.2.2.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { an EPC-MO-LR location session is initiated at the UE of type "assistanceData"  }
    then { UE sends a REGISTER message containing a LCS-MOLR invoke component }
}
```

(2)

```
with { UE having performed the last location request operation }
ensure that {
  when { UE has received a FACILITY message containing the LCS-MOLR return result component }
    then { UE terminates the dialogue by sending a RELEASE COMPLETE message }
}
```

7.2.2.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.2.1.

[TS 24.171, clause 5.2.2.1.1]

The UE invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

...

The network shall pass the result of the location procedure to the UE by sending a FACILITY message to the UE containing a LCS-MOLR return result component.

…

After the last location request operation the UE shall terminate the dialogue by sending a RELEASE COMPLETE message.

…

7.2.2.1.3 Test description

7.2.2.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals (Sub-test 15): As specified in 5.2.1.
- MBS signals (Sub-test 16): as specified in 5.2.4.
- WLAN signals (Sub-test 17): as specified in 5.2.5.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- Method of triggering an EPC-MO-LR request for assistance data.

7.2.2.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 7.2.2.1.3.2-0 below:

Table 7.2.2.1.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
8	Void
9	Void
10	Void
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 7.2.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
0	The SS sends a RESET UE POSITIONING STORED INFORMATION message.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
0A	Cause the UE to initiate MO-LR procedure	-	-	-	-
1	The UE sends a NAS PDU containing an MO-LR Request of type "assistanceData" inside an RRC UL Information Transfer message. The embedded LPP message specifies the type of assistance data.	-->	*ULInformationTransfer* (REGISTER)	1	P
2	The SS provides the requested assistance data in an LPP message of type "Assistance Data".	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
3	The SS sends a FACILITY message containing a LCS-MOLR return result component.	<--	*DLInformationTransfer* (FACILITY)	-	-
4	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	*ULInformationTransfer* (RELEASE COMPLETE)	2	P

7.2.2.1.3.3 Specific message contents

Table 7.2.2.1.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 0, Table 7.2.2.1.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 15: 0 0 0 0 0 0 0 0 Sub-test 16: 0 0 0 0 0 0 1 0 Sub-test 17: 0 0 0 0 0 0 1 1 Sub-test 18: 0 0 0 0 0 1 0 1	Sub-test 15: AGNSS Sub-test 16: MBS Sub-test 17: WLAN Sub-test 18: Sensor	

Table 7.2.2.1.3.3-1: *ULInformationTransfer* (steps 1 and 4, Table 7.2.2.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.2.1.3.3-2	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.2.1.3.3-2: UPLINK GENERIC NAS TRANSPORT (steps 1 and 4, Table 7.2.2.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000010	Location services message container	
Generic message container	**Step 1:** Set according to Table 7.2.2.1.3.3-3	REGISTER	
	Step 4: Set according to Table 7.2.2.1.3.3-11	RELEASE COMPLETE	
Additional information	Not present		

Table 7.2.2.1.3.3-3: REGISTER (step 1, Table 7.2.2.1.3.2-1)

Derivation Path: 24.080 Table 2.4			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	xx11 1011	REGISTER	
Facility	Invoke=LCS-MOLR	Set according to Table 7.2.2.1.3.3-4	
SS version	Version 1 or above		

Table 7.2.2.1.3.3-4: LCS-MOLRArg (step 1, Table 7.2.2.1.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LCS-MOLRArg ::= SEQUENCE {			
molr-Type	assistanceData		
multiplePositioningProtocolPDUs SEQUENCE (SIZE (1..3)) OF OCTET STRING	At least one LPP message of type Request Assistance Data (UE may include additional LPP messages)	Set according to Table 7.2.2.1.3.3-5	
}			

Table 7.2.2.1.3.3-5: LPP Request Assistance Data (step 1, Table 7.2.2.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	(0..255)		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestAssistanceData-r9 SEQUENCE {			
commonIEsRequestAssistanceData	Present or not present		
a-gnss-RequestAssistanceData	Present for sub-test 15. May be present for other sub-tests		
otdoa-RequestAssistanceData	Not present		
epdu-RequestAssistanceData	Not present		
sensor-RequestAssistanceData-r14	Present for sub-test 18. May be present for other sub-tests	Rel-14 onwards	
tbs-RequestAssistanceData-r14	Present for sub-test 16. May be present for other sub-tests	Rel-14 onwards	
wlan-RequestAssistanceData-r14	Present for sub-test 17. May be present for other sub-tests	Rel-14 onwards	
}			
}			
}			
}			
}			
}			

Table 7.2.2.1.3.3-6: *DLInformationTransfer* (steps 2 and 3, Table 7.2.2.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.2.1.3.3-7	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.2.1.3.3-7: DOWNLINK GENERIC NAS TRANSPORT (steps 2 and 3, Table 7.2.2.1.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	**Step 2:** 00000001	LTE Positioning Protocol (LPP) message container	
	Step 3: 00000010	Location services message container	
Generic message container	**Step 2:** Set according to Table 7.2.2.1.3.3-8	LPP Provide Assistance Data	
	Step 3: Set according to Table 7.2.2.1.3.3-9	FACILITY	
Additional information	**Step 2:** Present	Routing Identifier/ Correlation ID	
	Step 3: Not present.		

Table 7.2.2.1.3.3-8: LPP Provide Assistance Data (step 2, Table 7.2.2.1.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Assistance Data message in step 1 Table 7.2.2.1.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
a-gnss-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 1, Table 7.2.2.1.3.2-1 which are available according to TS 37.571-5 [12].		
sensor-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 1, Table 7.2.2.1.3.2-1 which are available according to subclause 5.4.1.5.	Rel-14 onwards	
tbs-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 1, Table 7.2.2.1.3.2-1 which are available according to subclause 5.4.1.3.	Rel-14 onwards	
wlan-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 1, Table 7.2.2.1.3.2-1 which are available according to subclause 5.4.1.4.	Rel-14 onwards	
}			
}			
}			
}			
}			
}			

Table 7.2.2.1.3.3-9: FACILITY (step 3, Table 7.2.2.1.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Facility message type	0011 1010	FACILITY	
Facility	Return Result=LCS-MOLRRes	Set according to Table 7.2.2.1.3.3-10	

Table 7.2.2.1.3.3-10: LCS-MOLRRes (step 3, Table 7.2.2.1.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LCS-MOLRRes::= SEQUENCE {	empty		
}			

Table 7.2.2.1.3.3-11: RELEASE COMPLETE (step 4, Table 7.2.2.1.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	

7.2.2.2 Basic Self Location: UE-assisted

7.2.2.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { an EPC-MO-LR location session is initiated at the UE of type "locationEstimate"  }
    then { UE sends a REGISTER message containing a LCS-MOLR invoke component }
            }
```

(2)

```
with { UE having performed the last location request operation }
ensure that {
  when { UE has received a FACILITY message containing the LCS-MOLR return result component }
    then { UE terminates the dialogue by sending a RELEASE COMPLETE message }
            }
```

7.2.2.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.171, clause 5.2.2.1.

[TS 24.171, clause 5.2.2.1.1]

The UE invokes a MO-LR by sending a REGISTER message to the network containing a LCS-MOLR invoke component. SS Version Indicator value 1 or above shall be used.

...

The network shall pass the result of the location procedure to the UE by sending a FACILITY message to the UE containing a LCS-MOLR return result component.

…

After the last location request operation the UE shall terminate the dialogue by sending a RELEASE COMPLETE message.

…

7.2.2.2.3 Test description

7.2.2.2.3.1 Pre-test conditions

System Simulator:

- Sub-tests 11, 12, 13, 14, 15, 16, 17, 18: Cell 1.
- Sub-test 5: Cell 1, Cell 2 as specified in 5.2.2.
- Sub-tests 6 FDD, 6 TDD: Cell 1, Cell 2 as specified in 5.2.3.
- Satellite signals (Sub-test 15): As specified in 5.2.1.
- WLAN signals (Sub-test 11, 17): as specified in 5.2.5.
- MBS signals (Sub-tests 12, 16): as specified in 5.2.4.
- Bluetooth signals (Sub-test 13): as specified in 5.2.6.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

- Method of triggering an EPC-MO-LR request for a location estimate.

7.2.2.2.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 7.2.2.2.3.2-0 below:

Table 7.2.2.2.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
5	UE supporting OTDOA
6 FDD	UE supporting ECID (FDD)
6 TDD	UE supporting ECID (TDD)
8	Void
9	Void
10	Void
11	UE supporting WLAN (Rel-13 only)
12	UE supporting MBS (Rel-13 only)
13	UE supporting Bluetooth
14	UE supporting Sensor (Rel-13 only)
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 7.2.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
0	IF NOT sub-test 6 FDD or sub-test 6 TDD THEN The SS sends a RESET UE POSITIONING STORED INFORMATION message.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
0A	Cause the UE to initiate MO-LR procedure	-	-	-	-
1	The UE sends a NAS PDU containing an MO-LR Request of type "locationEstimate" inside an RRC UL Information Transfer message. The MO-LR message may optionally include up to three LPP positioning messages.	-->	*ULInformationTransfer* (REGISTER)	1	P
2a	IF the UE does not include a LPP Provide Capabilities message in step 1 THEN the SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2b	IF the SS performed step 2a THEN the UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
2c	IF the UE LPP message at step 2b includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
2d	IF the UE included a LPP message of type Request Assistance Data in step 1 THEN SS sends a LPP message of type Provide Assistance Data including an error indication without assistance data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
3	IF NOT sub-test 6 FDD or sub-test 6 TDD or sub-test-11 or sub-test 12 or sub-test 13 or sub-test 14 THEN The SS sends a LPP message of type Provide Assistance Data including the assistance data as defined in subclause 5.4.1, dependent on UE capabilities.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
4	The SS sends a LPP message of type Request Location Information.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
5	The UE sends a LPP message of type Provide Location Information including measurements as requested at step 4.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	-	-
5a	IF the UE LPP message at step 5 includes an acknowledgement request THEN the SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
6	The SS sends a FACILITY message containing a LCS-MOLR return result component.	<--	*DLInformationTransfer* (FACILITY)	-	-
7	The UE terminates the dialogue by sending a RELEASE COMPLETE message.	-->	*ULInformationTransfer* (RELEASE COMPLETE)	2	P

7.2.2.2.3.3 Specific message contents

Table 7.2.2.2.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 0, Table 7.2.2.2.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 15: 0 0 0 0 0 0 0 0 Sub-test 5: 0 0 0 0 0 0 0 1 Sub-test 11, 17: 0 0 0 0 0 0 1 1 Sub-tests 12, 16: 0 0 0 0 0 0 1 0 Sub-test 13: 0 0 0 0 0 1 0 0 Sub-test 14, 18: 0 0 0 0 0 1 0 1	Sub-test 15: AGNSS Sub-test 5: OTDOA Sub-test 11, 17: WLAN Sub-tests 12, 16: MBS Sub-test 13: Bluetooth Sub-test 14, 18: Sensor	

Table 7.2.2.2.3.3-1: *ULInformationTransfer* (steps 1, 2b, 5 and 7, Table 7.2.2.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.2.2.3.3-2	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.2.2.3.3-2: UPLINK GENERIC NAS TRANSPORT (steps 1, 2b, 5 and 7, Table 7.2.2.2.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	**Steps 1 and 7:** 00000010	Location services message container	
	Step 2b, and 5: 00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1:** Set according to Table 7.2.2.2.3.3-3	REGISTER	
	Step 2b: Set according to Table 7.2.2.2.3.3-8	LPP Provide Capabilities	
	Step 5: Set according to Table 7.2.2.2.3.3-13	LPP Provide Location Information	
	Step 7: Set according to Table 7.2.2.2.3.3-16	RELEASE COMPLETE	
Additional information	**Steps 1 and 7:** Not present		
	Step 2b: Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 2a Table 7.2.2.2.3.2-1)	
	Step 5:	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 4 Table 7.2.2.2.3.2-1)	

Table 7.2.2.2.3.3-3: REGISTER (step 1, Table 7.2.2.2.3.2-1)

Derivation Path: 24.080 Table 2.4			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Register message type	xx11 1011	REGISTER	
Facility	Invoke=LCS-MOLR	Set according to Table 7.2.2.2.3.3-4	
SS version	Version 1 or above		

Table 7.2.2.2.3.3-4: LCS-MOLRArg (step 1, Table 7.2.2.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LCS-MOLRArg ::= SEQUENCE {			
molr-Type	locationEstimate		
multiplePositioningProtocolPDUs SEQUENCE (SIZE (1..3)) OF OCTET STRING	May include up to three LPP messages		
}			

Table 7.2.2.2.3.3-5: *DLInformationTransfer* (steps 2a, 2c, 2d, 3, 4, 5a and 6, Table 7.2.2.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.2.2.2.3.3-6	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.2.2.2.3.3-6: DOWNLINK GENERIC NAS TRANSPORT (steps 2a, 2c, 2d, 3, 4, 5a and 6, Table 7.2.2.2.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	**Step 2a, 2c, 2d, 3, 4, 5a:** 00000001	LTE Positioning Protocol (LPP) message container	
	Step 6: 00000010	Location services message container	
Generic message container	**Step 2a:** Set according to Table 7.2.2.2.3.3-7	LPP Request Capabilities	
	Step 2c, 5a: Set according to Table 7.2.2.2.3.3-9	LPP Acknowledgement	
	Step 2d: Set according to Table 7.2.2.2.3.3-10	LPP Provide Assistance Data	
	Step 3: Set according to Table 7.2.2.2.3.3-11	LPP Provide Assistance Data	
	Step 4: Set according to Table 7.2.2.2.3.3-12	LPP Request Location Information	
	Step 6: Set according to Table 7.2.2.2.3.3-14	FACILITY	
Additional information	**Steps 2a, 2c, 2d, 3, 4, 5a:** Present	Routing Identifier/ Correlation ID	
	Step 6: Not present.		

Table 7.2.2.2.3.3-7: LPP Request Capabilities (step 2a, Table 7.2.2.2.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.2.2.2.3.3-8: LPP Provide Capabilities (step 2b, Table 7.2.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 2a Table 7.2.2.2.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)	Contains a different value compared to any other UL message already sent by the UE.	
acknowledgement SEQUENCE {	Present, or not present.		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities SEQUENCE{	Dependent on UE capabilities		
ueRxTxSupTDD-r13	Present (TRUE) for sub-test 6 TDD	Rel-13 onwards	
}			
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.2.2.2.3.3-9: LPP Acknowledgement (steps 2c and 5a, Table 7.2.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	**Step 2c:** (0..255)	Contains the same value of the sequenceNumber field as received by the SS in the LPP Provide Capabilities message in step 2b, Table 7.2.2.2.3.2-1.	
	Step 5a: (0..255)	Contains the same value of the sequenceNumber field as received by the SS in the LPP Provide Location Information message in step 5, Table 7.2.2.2.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

Table 7.2.2.2.3.3-10: LPP Provide Assistance Data (step 2d, Table 7.2.2.2.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {		Contains the same value as any potential LPP Request Assistance Data message included by the UE at step 1, Table 7.2.2.2.3.2-1.	
Initiator	targetDevice		
transactionNumber	(0..255)		
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement	Not present.		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
commonIEsProvideAssistanceData	Not present		
a-gnss-ProvideAssistanceData SEQUENCE {	Present, if UE requested GNSS assistance data at step 1, Table 7.2.2.2.3.2-1.		
gnss-CommonAssistData	Not present		
gnss-GenericAssistData	Not present		
gnss-Error CHOICE {			
locationServerErrorCauses SEQUENCE {			
cause	undefined		
}			
}			
}			
otdoa-ProvideAssistanceData SEQUENCE {	Present, if UE requested OTDOA assistance data at step 1, Table 7.2.2.2.3.2-1.		
otdoa-ReferenceCellInfo	Not present		
otdoa-NeighbourCellInfo	Not present		
otdoa-Error CHOICE {			
locationServerErrorCauses SEQUENCE {			
cause	undefined		
}			
}			
}			
epdu-Provide-AssistanceData	Not present		
sensor-ProvideAssistanceData-r14 SEQUENCE {	Present, if UE requested Sensor assistance data at step 1, Table 7.2.2.2.3.2-1.	Rel-14 onwards	
sensor-AssistanceDataList-r14	Not present		
sensor-Error-r14 CHOICE{			
locationServerErrorCauses-r13 SEQUENCE {			
cause-r13	undefined		
}			
}			
}			
tbs-ProvideAssistanceData-r14 SEQUENCE {	Present, if UE requested MBS assistance data at step 1, Table 7.2.2.2.3.2-1.	Rel-14 onwards	

tbs-AssistanceDataList-r14	Not present		
tbs-Error-r14 CHOICE{			
locationServerErrorCauses-r13 SEQUENCE {			
cause-r13	undefined		
}			
}			
}			
wlan-ProvideAssistanceData-r14 SEQUENCE {	Present, if UE requested WLAN assistance data at step 1, Table 7.2.2.2.3.2-1.	Rel-14 onwards	
wlan-AssistanceDataList-r14	Not present		
wlan-Error-r14 CHOICE{			
locationServerErrorCauses-r13 SEQUENCE {			
cause-r13	undefined		
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.2.2.2.3.3-11: LPP Provide Assistance Data (step 3, Table 7.2.2.2.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-2 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

Table 7.2.2.2.3.3-12: LPP Request Location Information (step 4, Table 7.2.2.2.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsRequired		

Table 7.2.2.2.3.3-13: LPP ProvideLocation Information (step 5, Table 7.2.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Location Information message in step 4 Table 7.2.2.2.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)	Contains a different value compared to any other UL message already sent by the UE.	
acknowledgement SEQUENCE {	Present, or not present.		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation SEQUENCE {	May be present		
locationEstimate	Not present		
velocityEstimate	Not present		
locationError	Not present		
earlyFixReport-r12	Not present	Rel-12 onwards	
}			
a-gnss-ProvideLocationInformation	Present for sub-test 15. Any value acceptable		
otdoa-ProvideLocationInformation	Present for sub-test 5. Any value acceptable		
ecid-ProvideLocationInformation	Present for sub-tests 6 FDD, 6 TDD. Any value acceptable		
epdu-ProvideLocationInformation	Not present		
sensor-ProvideLocationInformation-r13	Present for sub-test 14, 18 Any value acceptable	Rel-13 onwards	
tbs-ProvideLocationInformation-r13	Present for sub-tests 12, 16 Any value acceptable	Rel-13 onwards	
wlan-ProvideLocationInformation-r13	Present for sub-test 11, 17 Any value acceptable	Rel-13 onwards	
bt-ProvideLocationInformation-r13	Present for sub-test 13 Any value acceptable	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.2.2.2.3.3-14: FACILITY (step 6, Table 7.2.2.2.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Facility message type	0011 1010	FACILITY	
Facility	Return Result=LCS-MOLRRes	Set according to Table 7.2.2.2.3.3-15	

Table 7.2.2.2.3.3-15: LCS-MOLRRes (step 6, Table 7.2.2.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LCS-MOLRRes::= SEQUENCE {			
locationEstimate	Any value. The SS shall not be required to calculate the value from the returned measurements.		
}			

Table 7.2.2.2.3.3-16: RELEASE COMPLETE (step 7, Table 7.2.2.2.3.2-1)

Derivation Path: 24.080 Table 2.5			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Release Complete message type	xx10 1010	RELEASE COMPLETE	

7.3 LPP Procedures

7.3.1 LPP Common Procedures

7.3.1.1 Position Capability Transfer

7.3.1.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message of type REQUEST CAPABILITIES }
    then { UE sends a LPP message of type PROVIDE CAPABILITIES with the correct supported
capabilities }
}
```

7.3.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.1.

[TS 36.355, clause 5.1.3]

Upon receiving a *RequestCapabilities* message, the target device shall generate a *ProvideCapabilities* message as a response.

The target device shall:

1> for each positioning method for which a request for capabilities is included in the message:

2> if the target device supports this positioning method:

3> include the capabilities of the device for that supported positioning method in the response message;

1> set the IE *LPP-TransactionID* in the response message to the same value as the IE *LPP-TransactionID* in the received message;

…

[TS 36.355, clause 5.1.4]

When triggered to transmit a *ProvideCapabilities* message, the target device shall:

1> for each positioning method whose capabilities are to be indicated:

2> set the corresponding IE to include the device's capabilities;

2> if OTDOA capabilities are to be indicated:

3> include the IE *supportedBandListEUTRA*;

…

7.3.1.1.3 Test description

7.3.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

7.3.1.1.3.2 Test procedure sequence

Table 7.3.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	1	P
2a	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

7.3.1.1.3.3 Specific message contents

Table 7.3.1.1.3.3-1: *DLInformationTransfer* (steps 1 and 2a, Table 7.3.1.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.1.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.1.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1 and 2a, Table 7.3.1.1.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1:** Set according to Table 7.3.1.1.3.3-3	LPP Request Capabilities	
	Step 2a: Set according to Table 7.3.1.1.3.3-14	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 7.3.1.1.3.3-3: LPP Request Capabilities (step 1, Table 7.3.1.1.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1 with the following exception:			
epdu-RequestCapabilities SEQUENCE (SIZE (1)) OF SEQUENCE{			
ePDU-Identifier SEQUENCE {			
ePDU-ID	1	OMA LPPe	
ePDU-Name	Not present		
}			
ePDU-Body	Set according to Table 7.3.1.1.3.3-15		
}			

Table 7.3.1.1.3.3-4: *ULInformationTransfer* (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.1.1.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.1.1.3.3-5: UPLINK GENERIC NAS TRANSPORT (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.3.1.1.3.3-6	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.1.1.3.2-1)	

Table 7.3.1.1.3.3-6: LPP Provide Capabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 7.3.1.1.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities SEQUENCE {	Dependent on UE capabilities	Rel-14 onwards	
segmentationInfo-r14	Not present		
lpp-message-segmentation-r14	Present or not present and value dependent on pc_LPP_MsgSegmentation	Rel-14 onwards	
}			
a-gnss-ProvideCapabilities SEQUENCE {	Present or not present dependent on (pc_UEB_AGNSS OR pc_UEA_AGNSS)		
gnss-SupportList	Set according to Table 7.3.1.1.3.3-7		
assistanceDataSupportList	Set according to Table 7.3.1.1.3.3-8		
locationCoordinateTypes	Present or not present dependent on pc_UEB_AGNSS. Set according to Table 7.3.1.1.3.3-9		
velocityTypes	Present or not present dependent on pc_UEB_AGNSS. Set according to Table 7.3.1.1.3.3-10		
periodicalReportingNotSupported-r14	Dependent on UE capabilities		Rel-14 onwards
idleStateForMeasurements-r14	Dependent on UE capabilities		Rel-14 onwards
}			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA. Set according to Table 7.3.1.1.3.3-11		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID. Set according to Table 7.3.1.1.3.3-12		

epdu-ProvideCapabilities	Present or not present dependent on UE capabilities. Set according to Table 7.3.1.1.3.3-13		
sensor-ProvideCapabilities-r13	Present or not present dependent on UE capabilities. Set according to Table 7.3.1.1.3.3-20	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Present or not present dependent on pc_UA_MBS. Set according to Table 7.3.1.1.3.3-17	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Present or not present dependent on UE capabilities. Set according to Table 7.3.1.1.3.3-18	Rel-13 onwards	
bt-ProvideCapabilities-r13	Present or not present dependent on UE capabilities. Set according to Table 7.3.1.1.3.3-19	Rel-13 onwards	
}			
}			
}			
}			
}			
}			
}			

Table 7.3.1.1.3.3-7: gnss-SupportList (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.2.9			
Information Element	**Value/remark**	**Comment**	**Condition**
gnss-SupportList SEQUENCE (SIZE(1..n)) OF SEQUENCE{		Size n of SEQUENCE is dependent on UE capabilities	
gnss-ID	Dependent on UE capabilities		
sbas-IDs	Dependent on UE capabilities	Present only if gnss-ID = sbas	
agnss-Modes	Dependent on UE capabilities		
gnss-Signals	Dependent on UE capabilities		
fta-MeasSupport SEQUENCE {	Present or not present dependent on pc_GNSS_FTA		
cellTime	Dependent on UE capabilities		
mode	Dependent on UE capabilities		
}			
adr-Support	Dependent on UE capabilities		
velocityMeasurementSupport	Dependent on UE capabilities		
adrEnhancementsSupport-r15	Dependent on UE capabilities	Rel-15 onwards	
ha-gnss-Modes-r15	Dependent on UE capabilities	Rel-15 onwards	
}			

Table 7.3.1.1.3.3-8: assistanceDataSupportList (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.2.9			
Information Element	**Value/remark**	**Comment**	**Condition**
assistanceDataSupportList SEQUENCE{			
gnss-CommonAssistanceDataSupport SEQUENCE{			
gnss-ReferenceTimeSupport	Present or not present and value dependent on UE capabilities.		
gnss-ReferenceLocationSupport	Present or not present and value dependent on UE capabilities.		
gnss-IonosphericModelSupport	Present or not present and value dependent on UE capabilities.		
gnss-EarthOrientationParametersSupport	Present or not present and value dependent on UE capabilities.		
gnss-RTK-ReferenceStationInfoSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-RTK-AuxiliaryStationDataSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
}			
gnss-GenericAssistanceDataSupport SEQUENCE (SIZE (1..n)) OF SEQUENCE{		Size n of SEQUENCE is dependent on UE capabilities	
gnss-ID	Dependent on UE capabilities		
sbas-ID	Dependent on UE capabilities	Present only if gnss-ID = sbas	
gnss-TimeModelsSupport	Present or not present and value dependent on UE capabilities.		
gnss-DifferentialCorrectionsSupport	Present or not present and value dependent on UE capabilities.		
gnss-NavigationModelSupport	Present or not present and value dependent on UE capabilities.		
gnss-RealTimeIntegritySupport	Present or not present and value dependent on UE capabilities.		
gnss-DataBitAssistanceSupport	Present or not present and value dependent on UE capabilities.		
gnss-AcquisitionAssistanceSupport	Present or not present and value dependent on UE capabilities.		
gnss-AlmanacSupport	Present or not present and value dependent on UE capabilities.		
gnss-UTC-ModelSupport	Present or not present and value dependent on UE capabilities.		
gnss-AuxiliaryInformationSupport	Present or not present and value dependent on UE capabilities.		
bds-DifferentialCorrectionsSupport-r12	Present or not present and value dependent on UE capabilities.	Rel-12 onwards	
bds-GridModelSupport-r12	Present or not present and value dependent on UE capabilities.	Rel-12 onwards	
gnss-RTK-ObservationsSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	

glo-RTK-BiasInformationSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-RTK-MAC-CorrectionDifferencesSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-RTK-ResidualsSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-RTK-FKP-GradientsSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-SSR-OrbitCorrectionsSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-SSR-ClockCorrectionsSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-SSR-CodeBiasSupport-r15	Present or not present and value dependent on UE capabilities.	Rel-15 onwards	
gnss-SSR-URA-Support-r16	Present or not present and value dependent on UE capabilities.	Rel-16 onwards	
gnss-SSR-PhaseBiasSupport-r16	Present or not present and value dependent on UE capabilities.	Rel-16 onwards	
gnss-SSR-STEC-CorrectionSupport-r16	Present or not present and value dependent on UE capabilities.	Rel-16 onwards	
gnss-SSR-GriddedCorrectionSupport-r16	Present or not present and value dependent on UE capabilities.	Rel-16 onwards	
navic-DifferentialCorrectionsSupport-r16	Present or not present and value dependent on UE capabilities.	Rel-16 onwards	
navic-GridModelSupport-r16	Present or not present and value dependent on UE capabilities.	Rel-16 onwards	
}			
}			

Table 7.3.1.1.3.3-9: locationCoordinateTypes (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.4.1			
Information Element	**Value/remark**	**Comment**	**Condition**
locationCoordinateTypes SEQUENCE {			
ellipsoidPoint	Dependent on UE capabilities		
ellipsoidPointWithUncertaintyCircle	Dependent on UE capabilities		
ellipsoidPointWithUncertaintyEllipse	Dependent on UE capabilities		
polygon	Dependent on UE capabilities		
ellipsoidPointWithAltitude	Dependent on UE capabilities		
ellipsoidPointWithAltitudeAndUncertaintyEllipsoid	Dependent on UE capabilities		
ellipsoidArc	Dependent on UE capabilities		
highAccuracyEllipsoidPointWithUncertaintyEllipse-r15	Dependent on UE capabilities	Rel-15 onwards	
highAccuracyEllipsoidPointWithAltitudeAndUncertaintyEllipsoid-r15	Dependent on UE capabilities	Rel-15 onwards	
}			

Table 7.3.1.1.3.3-10: velocityTypes (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.4.1			
Information Element	**Value/remark**	**Comment**	**Condition**
velocityTypes SEQUENCE {			
horizontalVelocity	Dependent on UE capabilities		
horizontalWithVerticalVelocity	Dependent on UE capabilities		
horizontalVelocityWithUncertainty	Dependent on UE capabilities		
horizontalWithVerticalVelocityAndUncertainty	Dependent on UE capabilities		
}			

Table 7.3.1.1.3.3-11: otdoa-ProvideCapabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.1.7			
Information Element	**Value/remark**	**Comment**	**Condition**
otdoa-ProvideCapabilities SEQUENCE {			
otdoa-Mode	Dependent on UE capabilities		
supportedBandListEUTRA SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Shall be present if otdoa-ProvideCapabilities is present	Size n of SEQUENCE is dependent on UE capabilities	
bandEUTRA	Dependent on UE capabilities. (NOTE: The reported OTDOA supported bands can be just a subset of the EUTRA supported bands)	If bandEUTRA-v9a0 is included, then the corresponding entry of this IE shall be set to maxFBI.	
}			
supportedBandListEUTRA-v9a0 SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Dependent on UE capabilities	Size n of SEQUENCE is dependent on UE capabilities	
bandEUTRA-v9a0	Dependent on UE capabilities. (NOTE: The reported OTDOA supported bands can be just a subset of the EUTRA supported bands)		
}			
interFreqRSTDmeasurement-r10	Dependent on UE capabilities		Rel-10 onwards
additionalNeighbourCellInfoList-r10	Dependent on UE capabilities		Rel-10 onwards
prs-id-r14	Dependent on UE capabilities		Rel-14 onwards
tp-separation-via-muting-r14	Dependent on UE capabilities		Rel-14 onwards
additional-prs-config-r14	Dependent on UE capabilities		Rel-14 onwards
prs-based-tbs-r14	Dependent on UE capabilities		Rel-14 onwards
additionalPathsReport-r14	Dependent on UE capabilities		Rel-14 onwards
densePrsConfig-r14	Dependent on UE capabilities		Rel-14 onwards
maxSupportedPrsBandwidth-r14	Dependent on UE capabilities		Rel-14 onwards
prsOccGroup-r14	Dependent on UE capabilities		Rel-14 onwards
prsFrequencyHopping-r14	Dependent on UE capabilities		Rel-14 onwards
maxSupportedPrsConfigs-r14	Dependent on UE capabilities		Rel-14 onwards
periodicalReporting-r14	Dependent on UE capabilities		Rel-14 onwards
multiPrbNprs-r14	Dependent on UE capabilities		Rel-14 onwards
idleStateForMeasurements-r14	Dependent on UE capabilities		Rel-14 onwards
numberOfRXantennas-r14	Dependent on UE capabilities		Rel-14 onwards
motionMeasurements-r15	Dependent on UE capabilities		Rel-15 onwards
interRAT-RSTDmeasurement-r15	Dependent on UE capabilities		Rel-15 onwards
}			
}			

Table 7.3.1.1.3.3-12: ecid-ProvideCapabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
ecid-ProvideCapabilities SEQUENCE {			
ecid-MeasSupported	Dependent on UE capabilities		
ueRxTxSupTDD-r13	Dependent on UE capabilities		Rel-13 onwards
periodicalReporting-r14	Dependent on UE capabilities		Rel-14 onwards
triggeredReporting-r14	Dependent on UE capabilities		Rel-14 onwards
idleStateForMeasurements-r14	Dependent on UE capabilities		Rel-14 onwards
}			
}			

Table 7.3.1.1.3.3-13: epdu-ProvideCapabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.4.1			
Information Element	**Value/remark**	**Comment**	**Condition**
epdu-ProvideCapabilities SEQUENCE (SIZE (1)) OF SEQUENCE{			
ePDU-Identifier SEQUENCE {			
ePDU-ID	1	OMA LPPe	
ePDU-Name	Present or not present.		
}			
ePDU-Body	Set according to Table 7.3.1.1.3.3-16		
}			

Table 7.3.1.1.3.3-14: LPP Acknowledgement (step 2a, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 2, Table 7.3.1.1.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

Table 7.3.1.1.3.3-15: ePDU-Body OCTET STRING (step 1, Table 7.3.1.1.3.2-1)

Derivation Path: OMA-TS-LPPe-V1_0 [28] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
OMA-LPPe-MessageExtension ::= SEQUENCE {			
lppeCompatibilityLevel	0		
lppeVersion SEQUENCE {			
majorVersion	1		
minorVersion	0		

}			
lppeMode	normal		
messageExtensionBody CHOICE {			
requestCapabilities SEQUENCE {			
commonIEsRequestCapabilities SEQUENCE {			
iP-Address-RequestCapabilities SEQUENCE {	Present		
}			
assistanceContainerSupportReq SEQUENCE {	Present		
vendorOrOperatorIDList	Not present		
}			
locationInformationContainerSupportReq SEQUENCE {	Present		
vendorOrOperatorIDList	Not present		
}			
relativeLocationChange-RequestCapabilities SEQUENCE {	Present		
}			
highAccuracyFormatCapabilitiesReq SEQUENCE {	Present		
}			
segmentedAssistanceData-ReqCapabilities SEQUENCE {	Present		
}			
referencePointCapabilitiesReq SEQUENCE {	Present		
referencePointProviderSupportListReq	Not present		
}			
scheduledLocation-RequestCapabilities SEQUENCE {	Present		
}			
accessCapabilitiesReq SEQUENCE {	Present		
}			
segmentedLocationInformation-ReqCapabilities SEQUENCE {	Present		
}			
}			
agnss-RequestCapabilities SEQUENCE {			
assistanceDataSupportListReq	Present		
environmentObservationSupportListReq	Present		
haGNSSsupportReq	Present		
}			
otdoa-RequestCapabilities SEQUENCE {	Present		
}			
eotd-RequestCapabilities SEQUENCE {	Present		
}			
otdoa-utra-RequestCapabilities SEQUENCE {	Present		
}			
ecid-lte-RequestCapabilities SEQUENCE {	Present		
}			
ecid-gsm-RequestCapabilities SEQUENCE {	Present		
}			
ecid-utra-RequestCapabilities SEQUENCE {	Present		
}			
wlan-ap-RequestCapabilities SEQUENCE {	Present		
}			
ecid-wimax-RequestCapabilities SEQUENCE {	Present		
}			
sensor-RequestCapabilities SEQUENCE {	Present		
}			
srn-RequestCapabilities SEQUENCE {	Present		
capabilitiesRequestedFor	Not present		
}			
}			
}			
}			

Table 7.3.1.1.3.3-16: ePDU-Body OCTET STRING (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: OMA-TS-LPPe-V1_0 [28] clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
OMA-LPPe-MessageExtension ::= SEQUENCE {			
lppeCompatibilityLevel	0		
lppeVersion SEQUENCE {			
majorVersion	1		
minorVersion	0		
}			
lppeMode	normal		
messageExtensionBody CHOICE {			
provideCapabilities SEQUENCE {			
commonIEsProvideCapabilities	Present or not present and value dependent on UE capabilities.		
agnss-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
otdoa-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
eotd-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
otdoa-utra-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
ecid-lte-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
ecid-gsm-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
ecid-utra-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
wlan-ap-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
ecid-wimax-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
sensor-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
srn-ProvideCapabilities	Present or not present and value dependent on UE capabilities.		
}			
}			
}			

Table 7.3.1.1.3.3-17: tbs-ProvideCapabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.4.4			
Information Element	**Value/remark**	**Comment**	**Condition**
tbs-ProvideCapabilities-r13 SEQUENCE {		Rel-13 onwards	
tbs-Modes-r13	Dependent on UE capabilities		
mbs-AssistanceDataSupportList-r14	Dependent on UE capabilities	Rel-14 onwards	
periodicalReportingSupported-r14	Dependent on UE capabilities	Rel-14 onwards	
mbs-ConfigSupport-r14	Dependent on UE capabilities	Rel-14 onwards	
mbs-IdleStateForMeasurements-r14	Dependent on UE capabilities	Rel-14 onwards	
}			
}			

Table 7.3.1.1.3.3-18: wlan-ProvideCapabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.6.4			
Information Element	**Value/remark**	**Comment**	**Condition**
wlan-ProvideCapabilities-r13 SEQUENCE {		Rel-13 onwards	
wlan-Modes-r13	Dependent on UE capabilities		
wlan-MeasSupported-r13	Dependent on UE capabilities		
wlan-AP-AD-Supported-r14	Dependent on UE capabilities	Rel-14 onwards	
periodicalReportingSupported-r14	Dependent on UE capabilities	Rel-14 onwards	
idleStateForMeasurements-r14	Dependent on UE capabilities	Rel-14 onwards	
}			
}			

Table 7.3.1.1.3.3-19: bt-ProvideCapabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.7.4			
Information Element	**Value/remark**	**Comment**	**Condition**
bt-ProvideCapabilities-r13 SEQUENCE {		Rel-13 onwards	
bt-Modes-r13	Dependent on UE capabilities		
bt-MeasSupported-r13	Dependent on UE capabilities		
idleStateForMeasurements-r14	Dependent on UE capabilities	Rel-14 onwards	
periodicalReportingSupported-r14	Dependent on UE capabilities	Rel-14 onwards	
}			
}			

Table 7.3.1.1.3.3-20: sensor-ProvideCapabilities (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 36.355 clause 6.5.5.4			
Information Element	**Value/remark**	**Comment**	**Condition**
sensor-ProvideCapabilities-r13 SEQUENCE {		Rel-13 onwards	
sensor-Modes-r13	Dependent on UE capabilities		
sensor-AssistanceDataSupportList-r14	Dependent on UE capabilities	Rel-14 onwards	
periodicalReportingSupported-r14	Dependent on UE capabilities	Rel-14 onwards	
idleStateForMeasurements-r14	Dependent on UE capabilities	Rel-14 onwards	
sensor-MotionInformationSup-r15	Dependent on UE capabilities	Rel-15 onwards	
adjustmentSupported-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			

7.3.2 LPP Transport

7.3.2.1 LPP Duplicated Message

7.3.2.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message carrying the same sequence number as that last received for the
         associated location session }
    then { UE discards the LPP message }
}
```

7.3.2.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 4.3.

[TS 36.355, clause 4.3.1]

A UE implementing LPP for the control plane solution shall support LPP reliable transport (including all three of duplicate detection, acknowledgement, and retransmission).

The following requirements in subclauses 4.3.2, 4.3.3, and 4.3.4 [LPP] for LPP reliable transport apply only when the capability is supported.

[TS 36.355, clause 4.3.2]

A sender shall include a sequence number in all LPP messages sent for a particular location session. The sequence number shall be distinct for different LPP messages sent in the same direction in the same location session.

…

A receiver shall record the most recent received sequence number for each location session. If a message is received carrying the same sequence number as that last received for the associated location session, it shall be discarded.

7.3.2.1.3 Test description

7.3.2.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

7.3.2.1.3.2 Test procedure sequence

Table 7.3.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities including a sequence number.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	Immediately after step 1, the SS sends the same LPP message as in step 1.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
3	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
3a	IF the UE LPP message at step 3 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4	The SS waits for 10 seconds to ensure the UE does not send another LPP message of type Provide Capabilities with the same transaction ID as received in step 1 or 2.			1	P

7.3.2.1.3.3 Specific message contents

Table 7.3.2.1.3.3-1: *DLInformationTransfer* (steps 1, 2, and 3a, Table 7.3.2.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.2.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.2.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, 2 and 3a, Table 7.3.2.1.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Steps 1 and 2:** Set according to Table 7.3.2.1.3.3-3	LPP Request Capabilities	
	Step 3a: Set according to Table 7.3.2.1.3.3-7	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.2.1.3.3-3: LPP Request Capabilities (steps 1 and 2, Table 7.3.2.1.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1 with the following exceptions:			
sequenceNumber	0		

Table 7.3.2.1.3.3-4: *ULInformationTransfer* (step 3, Table 7.3.2.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.2.1.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.2.1.3.3-5: UPLINK GENERIC NAS TRANSPORT (step 3, Table 7.3.2.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.3.2.1.3.3-6	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.2.1.3.2-1)	

Table 7.3.2.1.3.3-6: LPP Provide Capabilities (step 3, Table 7.3.2.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 7.3.2.1.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			

Table 7.3.2.1.3.3-7: LPP Acknowledgement (step 3a, Table 7.3.2.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 3, Table 7.3.2.1.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

7.3.2.2 LPP Acknowledgment

7.3.2.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message carrying an acknowledgement request indicator  }
    then { UE returns an acknowledgement response }
           }
```

7.3.2.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 4.3.

[TS 36.355, clause 4.3.1]

A UE implementing LPP for the control plane solution shall support LPP reliable transport (including all three of duplicate detection, acknowledgement, and retransmission).

The following requirements in subclauses 4.3.2, 4.3.3, and 4.3.4 [LPP] for LPP reliable transport apply only when the capability is supported.

[TS 36.355, clause 4.3.3.1]

Upon reception of an LPP message which includes the IE *ackRequested* set to TRUE, a receiver returns an LPP message with an acknowledgement response, i.e., that includes the *ackIndicator* IE set to the same sequence number of the message being acknowledged.

An acknowledgment response may contain no LPP message body (in which case only the sequence number being acknowledged is significant); alternatively, the acknowledgment may be sent in an LPP message along with an LPP message body.

7.3.2.2.3 Test description

7.3.2.2.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

7.3.2.2.3.2 Test procedure sequence

Table 7.3.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities including a request for acknowledgement.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2 Option 1	Option 1: The UE sends an acknowledgement along with an LPP message of type Provide Capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES, incl. acknowledgement response)	1	P
2 Option 2	Option 2: The UE sends a LPP Acknowledgement response, followed by a LPP message of type Provide Capabilities.	--> -->	*ULInformationTransfer* (LPP ACKNOWLEDGEMENT) *ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	1	P
3	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

7.3.2.2.3.3 Specific message contents

Table 7.3.2.2.3.3-1: *DLInformationTransfer* (steps 1, and 3, Table 7.3.2.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.2.2.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.2.2.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 1, and 3, Table 7.3.2.2.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1:** Set according to Table 7.3.2.2.3.3-3	LPP Request Capabilities	
	Step 3: Set according to Table 7.3.2.2.3.3-8	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.2.2.3.3-3: LPP Request Capabilities (step 1, Table 7.3.2.2.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1 with the following exceptions:			
sequenceNumber	0		
acknowledgement SEQUENCE {			
ackRequested	TRUE		
ackIndicator	Not present		
}			

Table 7.3.2.2.3.3-4: *ULInformationTransfer* (step 2, Table 7.3.2.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.2.2.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.2.2.3.3-5: UPLINK GENERIC NAS TRANSPORT (step 2, Table 7.3.2.2.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 2:** Set according to Table 7.3.2.2.3.3-6	LPP Provide Capabilities	
	Step 2 (Option 2), Set according to Table 7.3.2.2.3.3-7	LPP Acknowledgement	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message	

Table 7.3.2.2.3.3-6: LPP Provide Capabilities (step 2, Table 7.3.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 7.3.2.2.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present. Present for Option 1.		
ackRequested	TRUE or FALSE		
ackIndicator	0 (Option 1) Not present (Option 2)		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			

Table 7.3.2.2.3.3-7: LPP Acknowledgement (step 2 – Option 2, Table 7.3.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	FALSE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	0		
}			
lpp-MessageBody	Not present.		
}			

Table 7.3.2.2.3.3-8: LPP Acknowledgement (step 3, Table 7.3.2.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 2, Table 7.3.2.2.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

7.3.2.3 LPP Retransmission

7.3.2.3.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing}
ensure that {
  when { UE does not receive an LPP acknowledgement for an LPP message which requires
         acknowledgement }
    then { UE retransmits the LPP message up to three times. If still unacknowledged after that, the
           UE aborts all LPP activity for the associated session}
}
```

7.3.2.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 4.3.

[TS 36.355, clause 4.3.1]

A UE implementing LPP for the control plane solution shall support LPP reliable transport (including all three of duplicate detection, acknowledgement, and retransmission).

The following requirements in subclauses 4.3.2, 4.3.3, and 4.3.4 [LPP] for LPP reliable transport apply only when the capability is supported.

[TS 36.355, clause 4.3.4.1]

When an LPP message which requires acknowledgement is sent and not acknowledged, it is resent by the sender following a timeout period up to three times. If still unacknowledged after that, the sender aborts all LPP activity for the associated session.

7.3.2.3.3 Test description

7.3.2.3.3.1 Pre-test conditions

System Simulator:

- Cell 1.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

- UE supporting sending of acknowledgement request in LPP Provide Capabilities message.

7.3.2.3.3.2 Test procedure sequence

Table 7.3.2.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends a LPP message of type Provide Capabilities including a request for acknowledgement along with a sequence number.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
3	SS does not send an acknowledgement			-	-
4	After an implementation specific timeout period, the UE retransmits the LPP message from step 2 and includes the same sequence number as in step 2.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	1	P
5	SS does not send an acknowledgement			-	-
6	The UE either proceeds directly to step 10 or after an implementation specific timeout period, the UE retransmits the LPP message from step 2 and includes the same sequence number as in step 2.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
7	SS does not send an acknowledgement			-	-
8	The UE either proceeds directly to step 10 or after an implementation specific timeout period, the UE retransmits the LPP message from step 2 and includes the same sequence number as in step 2.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
9	SS does not send an acknowledgement				
10	UE aborts all procedures and activity associated with LPP support for the location session. SS waits for 10 seconds to ensure the UE does not send another LPP message.			1	P

7.3.2.3.3.3 Specific message contents

Table 7.3.2.3.3.3-1: *DLInformationTransfer* (step 1, Table 7.3.2.3.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.2.3.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.2.3.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (step 1, Table 7.3.2.3.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.3.2.3.3.3-3	LPP Request Capabilities	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.2.3.3.3-3: LPP Request Capabilities (step 1, Table 7.3.2.3.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1.			

Table 7.3.2.3.3.3-4: *ULInformationTransfer* (steps 2, 4, 6, and 8, Table 7.3.2.3.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.2.3.3.3-5	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.2.3.3.3-5: UPLINK GENERIC NAS TRANSPORT (steps 2, 4, 6, and 8, Table 7.3.2.3.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.3.2.3.3.3-6	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message	

Table 7.3.2.3.3.3-6: LPP Provide Capabilities (steps 2, 4, 6, and 8, Table 7.3.2.3.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1 Table 7.3.2.3.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {			
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			

7.3.3 LPP Error Handling

7.3.3.1 Void

7.3.3.1A Void

7.3.3.1B LPP Requested Method not Supported – UE-Assisted

7.3.3.1B.1 Test Purpose (TP)

(1)

```
with {  a UE supporting at least one of UE-assisted GNSS, UE-assisted OTDOA, UE-assisted ECID, UE-
assisted WLAN, UE-assisted Bluetooth, UE-assisted Sensor or UE-assisted MBS but not all of them }
and with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP message requesting at least one location method not supported }
    then { the UE provides location information for the supported methods}
}
```

7.3.3.1B.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clauses 5.3.3 and 5.4.3.

[TS 36.355, clause 5.3.3]

Upon receiving a *RequestLocationInformation* message, the target device shall:

1> if the requested information is compatible with the target device capabilities and configuration:

[…]

1> otherwise:

2> if one or more positioning methods are included that the target device does not support:

3> continue to process the message as if it contained only information for the supported positioning methods;

3> handle the signalling content of the unsupported positioning methods by LPP error detection as in 5.4.3.

[TS 36.355, clause 5.4.3]

Upon receiving any LPP message, the receiving entity shall attempt to decode the message and verify the presence of any errors and:

1> if the message type is an LPP *RequestAssistanceData* or *RequestLocationInformation* and some or all of the requested information is not supported:

2> return any information that can be provided in a normal response, which includes indications on other information that is not supported.

7.3.3.1B.3 Test description

7.3.3.1B.3.1 Pre-test conditions

System Simulator:

- If OTDOA is supported by the UE: Cells 1 and 2, as specified in 5.2.2.
- If ECID is supported by the UE: Cells 1 and 2, as specified in 5.2.3. If OTDOA is also supported then Cells 1 and 2 are as specified in 5.2.2.

- If GNSS is supported by the UE: Cell 1 and satellite signals, as specified in 5.2.1. If OTDOA is also supported then Cell 1 is as specified in 5.2.2.
- If WLAN is supported by the UE: Cell 1 and WLAN signals, as specified in 5.2.5.
- If MBS is supported by the UE: Cell 1 and MBS signals, as specified in 5.2.4.
- If Bluetooth is supported by the UE: Cell 1 and Bluetooth signals, as specified in 5.2.6.
- If Sensor is supported by the UE: Cell 1.

UE:

- -

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

- -

7.3.3.1B.3.2 Test procedure sequence

Table 7.3.3.1B.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
0	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
0a	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
0b	IF the UE LPP message at step 0a includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
1	IF the UE supports any positioning method other than ECID or Bluetooth, THEN the SS sends a LPP message of type Provide Assistance Data containing the data for all supported positioning methods.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
2	The SS sends a LPP message of type Request Location Information including all specified positioning methods.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
3	The UE sends a LPP message of type Provide Location Information including information for the supported method(s).	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
3a	IF the UE LPP message at step 3 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

7.3.3.1B.3.3 Specific message contents

Table 7.3.3.1B.3.3-1: *DLInformationTransfer* (steps 0, 0b, 1, 2 and 3a, Table 7.3.3.1B.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.3.1B.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.3.1B.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 0, 0b, 1, 2 and 3a, Table 7.3.3.1B.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 0:** Set according to Table 7.3.3.1B.3.3-2a	LPP Request Capabilities.	
	Step 1: Set according to Table 7.3.3.1B.3.3-3	LPP Provide Assistance Data	
	Step 2: Set according to Table 7.3.3.1B.3.3-4	LPP Request Location Information	
	Steps 0b and 3a: Set according to Table 7.3.3.1B.3.3-8	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.3.1B.3.3-2a: LPP Request Capabilities (step 0, Table 7.3.3.1B.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.3.3.1B.3.3-3: LPP Provide Assistance data (step 1, Table 7.3.3.1B.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-2 with the following exceptions:			
transactionID SEQUENCE {			
Initiator	locationServer		
transactionNumber	(0..255)		
}			
a-gnss-ProvideAssistanceData	Present for all supported GNSSs if UE supports UE-assisted A-GNSS. As defined in clause 5.4		
otdoa-ProvideAssistanceData	Present if UE supports UE-assisted OTDOA. As defined in clause 5.4		
sensor-ProvideAssistanceData-r14	Present if UE supports UE-assisted Sensor. As defined in clause 5.4	Rel-14 onwards	
tbs-ProvideAssistanceData-r14	Present if UE supports UE-assisted MBS. As defined in clause 5.4	Rel-14 onwards	
wlan-ProvideAssistanceData-r14	Present if UE supports UE-assisted WLAN. As defined in clause 5.4	Rel-14 onwards	

Table 7.3.3.1B.3.3-4: LPP Request Location Information (step 2, Table 7.3.3.1B.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsRequired		
a-gnss-RequestLocationInformation	Present. As defined in Table 5.4-4		
gnss-Methods	GNSS-ID-Bitmap: bits 0, 3, 4, 5 = 1		
otdoa-RequestLocationInformation	Present. As defined in Table 5.4-5		
ecid-RequestLocationInformation	Present. As defined in Table 5.4-6		
requestedMeasurements	bits 0, 1, 2 = 1		
tbs-RequestLocationInformation-r13	Present. As defined in Table 5.4-7	Rel-13 onwards	
sensor-RequestLocationInformation-r13	Present. As defined in Table 5.4-10	Rel-13 onwards	
wlan-RequestLocationInformation-r13	Present. As defined in Table 5.4-8	Rel-13 onwards	
bt-RequestLocationInformation-r13	Present. As defined in Table 5.4-9	Rel-13 onwards	

Table 7.3.3.1B.3.3-5: *ULInformationTransfer* (steps 0a and 3, Table 7.3.3.1B.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.3.1B.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.3.1B.3.3-6: UPLINK GENERIC NAS TRANSPORT (steps 0a and 3, Table 7.3.3.1B.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 0a:** Set according to Table 7.3.3.1B.3.3-6a	LPP Provide Capabilities	
	Step 3: Set according to Table 7.3.3.1B.3.3-7	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 0 or 2 Table 7.3.3.1B.3.2-1)	

Table 7.3.3.1B.3.3-6a: LPP Provide Capabilities (step 0a, Table 7.3.3.1B.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 0, Table 7.3.3.1B.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			

Table 7.3.3.1B.3.3-7: LPP Provide Location Information (step 3, Table 7.3.3.1B.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
Initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 2, Table 7.3.3.1B.3.1-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation SEQUENCE {	May be present		
locationEstimate	Not present		
velocityEstimate	Not present		
locationError	Not present		
earlyFixReport-r12	Not present	Rel-12 onwards	
}			
a-gnss-ProvideLocationInformation SEQUENCE {	Present if UE supports UE-assisted A-GNSS.		
gnss-SignalMeasurementInformation	Present for each supported GNSS. Any value acceptable		
gnss-LocationInformation	Not present		
gnss-Error	May be present if UE only supports one GNSS		
}			
otdoa-ProvideLocationInformation SEQUENCE {	Present if UE supports UE-assisted OTDOA.		
otdoa-SignalMeasurementInformation	Present. Any value acceptable		
otdoa-Error	May be present		
}			
ecid-ProvideLocationInformation SEQUENCE {	Present if UE supports UE-assisted ECID.		
ecid-SignalMeasurementInformation	Present. Any value acceptable		
ecid-Error	May be present		
}			
epdu-ProvideLocationInformation	Not present		
sensor-ProvideLocationInformation-r13 SEQUENCE {	Present if UE supports UE-assisted Sensor.	Rel-13 onwards	
sensor-MeasurementInformation-r13	Present. Any value acceptable		
sensor-Error-r13	May be present		
}			
tbs-ProvideLocationInformation-r13 SEQUENCE {	Present if UE supports UE-assisted MBS	Rel-13 onwards	

tbs-MeasurementInformation-r13 SEQUENCE {			
measurementReferenceTime-r13	Present. Any value acceptable		
mbs-SgnMeasList-r13	Present. Any value acceptable		
}			
tbs-Error-r13	May be present		
}			
wlan-ProvideLocationInformation-r13 SEQUENCE {	Present if UE supports UE-assisted WLAN.	Rel-13 onwards	
wlan-MeasurementInformation-r13	Present. Any value acceptable		
wlan-Error-r13	May be present		
}			
bt-ProvideLocationInformation-r13 SEQUENCE {	Present if UE supports UE-assisted Bluetooth.	Rel-13 onwards	
bt-MeasurementInformation-r13	Present. Any value acceptable		
bt-Error-r13	May be present		
}			
}			
}			
}			
}			
}			

Table 7.3.3.1B.3.3-8: LPP Acknowledgement (steps 0b and 3a, Table 7.3.3.1B.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 0a or 3, Table 7.3.3.1B.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

7.3.4 LPP Positioning Procedures

7.3.4.1 E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Based

7.3.4.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives assistance data and a location request for UE-based  }
    then { UE sends a PROVIDE LOCATION INFORMATION  message containing a location estimate }
            }
```

7.3.4.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.2.4, 5.3.3 and 5.3.4.

[TS 36.355, clause 5.2.4]

Upon receiving a *ProvideAssistanceData* message, the target device shall:

1> for each positioning method contained in the message:

2> deliver the related assistance data to upper layers.

[TS 36.355, clause 5.3.3]

Upon receiving a *RequestLocationInformation* message, the target device shall:

1> if the requested information is compatible with the target device capabilities and configuration:

2> include the requested information in a *ProvideLocationInformation* message;

2> set the IE *LPP-TransactionID* in the response to the same value as the IE *LPP-TransactionID* in the received message;

2> deliver the *ProvideLocationInformation* message to lower layers for transmission.

1> otherwise:

[…]

[TS 36.355, clause 5.3.4]

When triggered to transmit *ProvideLocationInformation* message, the target device shall:

1> for each positioning method contained in the message:

2> set the corresponding IE to include the available location information;

1> deliver the response to lower layers for transmission.

7.3.4.1.3 Test description

7.3.4.1.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals (sub-test case 15): As specified in 5.2.1.
- MBS signals (Sub-test 16): As specified in 5.2.4 .
- WLAN signals (Sub-test 17): as specified in 5.2.5.

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

-

7.3.4.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 7.3.4.1.3.2-0 below:

Table 7.3.4.1.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
8	Void
9	Void
10	Void
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 7.3.4.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The stored assistance data in the UE are cleared.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
1a	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
1b	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
1c	IF the UE LPP message at step 1b includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
2	The SS sends a LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
3	The SS sends a LPP message of type Request Location Information including a request for a location estimate.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
4	The UE sends a LPP message of type Provide Location Information including a location estimate.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
4a	IF the UE LPP message at step 4 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

7.3.4.1.3.3 Specific message contents

Table 7.3.4.1.3.3-1: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.1.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 15: 0 0 0 0 0 0 0 0 Sub-test 16: 0 0 0 0 0 0 1 0 Sub-test 17: 0 0 0 0 0 0 1 1 Sub-test 18: 0 0 0 0 0 1 0 1	Sub-test 15: GNSS Sub-test 16: MBS Sub-test 17: WLAN Sub-test 18: Sensor	

Table 7.3.4.1.3.3-2: *DLInformationTransfer* (steps 1a, 1c, 2, 3 and 4a, Table 7.3.4.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.4.1.3.3-3	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.1.3.3-3: DOWNLINK GENERIC NAS TRANSPORT (steps 1a, 1c, 2, 3 and 4a, Table 7.3.4.1.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1a:** Set according to Table 7.3.4.1.3.3-3a	LPP Request Capabilities.	
	Step 2: Set according to Table 7.3.4.1.3.3-4	LPP Provide Assistance Data	
	Step 3: Set according to Table 7.3.4.1.3.3-5	LPP Request Location Information	
	Steps 1c and 4a: Set according to Table 7.3.4.1.3.3-9	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.4.1.3.3-3a: LPP Request Capabilities (step 1a, Table 7.3.4.1.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.3.4.1.3.3-4: LPP Provide Assistance data (step 2, Table 7.3.4.1.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-2 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

Table 7.3.4.1.3.3-5: LPP Request Location Information (step 3, Table 7.3.4.1.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationEstimateRequired		

Table 7.3.4.1.3.3-6: *ULInformationTransfer* (steps 1b and 4, Table 7.3.4.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			

dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.4.1.3.3-7	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.1.3.3-7: UPLINK GENERIC NAS TRANSPORT (steps 1b and 4, Table 7.3.4.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobilitymanagement messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1b:** Set according to Table 7.3.4.1.3.3-7a	LPP Provide Capabilities	
	Step 4: Set according to Table 7.3.4.1.3.3-8	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1a or 3 Table 7.3.4.1.3.2-1)	

Table 7.3.4.1.3.3-7a: LPP Provide Capabilities. (step 1b, Table 7.3.4.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1a, Table 7.3.4.1.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.3.4.1.3.3-8: LPP Provide Location Information (step 4, Table 7.3.4.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location	

		Information message in step 3, Table 7.3.4.1.3.1-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation SEQUENCE {	Present		
locationEstimate	Present. Any value acceptable		
velocityEstimate	Not present		
locationError	Not present		
earlyFixReport-r12	Not present	Rel-12 onwards	
}			
a-gnss-ProvideLocationInformation SEQUENCE {	Present for sub-test 15		
gnss-SignalMeasurementInformation	Not present		
gnss-LocationInformation SEQUENCE {	Present		
measurementReferenceTime	Any value acceptable		
agnss-List	Any value acceptable		
}			
gnss-Error	Not present		
}			
otdoa-ProvideLocationInformation	Not present		
ecid-ProvideLocationInformation	Not present		
epdu-ProvideLocationInformation	Not present		
sensor-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 18	Rel-13 onwards	
sensor-MeasurementInformation-r13	Present. Any value acceptable		
sensor-Error-r13	Not present		
}			
tbs-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 16	Rel-13 onwards	
tbs-MeasurementInformation-r13 SEQUENCE {	Present	Rel-13 onwards	
measurementReferenceTime-r13	Any value acceptable		
mbs-SgnMeasList-r13	Any value acceptable		
}			
tbs-Error-r13	Not present	Rel-13 onwards	
}			
wlan-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 17	Rel-13 onwards	
wlan-MeasurementInformation-r13	Present. Any value acceptable		
wlan-Error-r13	Not present		
}			
bt-ProvideLocationInformation-r13	Not present	Rel-13 onwards	
}			
}			
}			
}			
}			

}			

Table 7.3.4.1.3.3-9: LPP Acknowledgement (steps 1c and 4a, Table 7.3.4.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 1b or 4, Table 7.3.4.1.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

7.3.4.2 E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted

7.3.4.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives assistance data and a location request for UE-assisted  }
    then { UE sends a PROVIDE LOCATION INFORMATION  message containing location measurements }
           }
```

7.3.4.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.2.4, 5.3.3 and 5.3.4.

[TS 36.355, clause 5.2.4]

Upon receiving a *ProvideAssistanceData* message, the target device shall:

1> for each positioning method contained in the message:

2> deliver the related assistance data to upper layers.

[TS 36.355, clause 5.3.3]

Upon receiving a *RequestLocationInformation* message, the target device shall:

1> if the requested information is compatible with the target device capabilities and configuration:

2> include the requested information in a *ProvideLocationInformation* message;

2> set the IE *LPP-TransactionID* in the response to the same value as the IE *LPP-TransactionID* in the received message;

2> deliver the *ProvideLocationInformation* message to lower layers for transmission.

1> otherwise:

[…]

[TS 36.355, clause 5.3.4]

When triggered to transmit *ProvideLocationInformation* message, the target device shall:

1> for each positioning method contained in the message:

2> set the corresponding IE to include the available location information;

1> deliver the response to lower layers for transmission.

7.3.4.2.3 Test description

7.3.4.2.3.1 Pre-test conditions

System Simulator:

- Sub-tests 11, 12, 13, 14, 15, 16, 17, 18: Cell 1.
- Sub-test 5 and 7: Cells 1 and 2, as specified in 5.2.2.
- Sub-tests 6 FDD, 6 TDD: Cells 1 and 2, as specified in 5.2.3.
- Satellite signals (Sub-test 15): As specified in 5.2.1.
- WLAN signals (Sub-test 11, 17): as specified in 5.2.5.
- MBS signals (Sub-tests 12, 16): as specified in 5.2.4
- Bluetooth signals (Sub-test 13): as specified in 5.2.6.

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

-

7.3.4.2.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 7.3.4.2.3.2-0 below:

Table 7.3.4.2.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
5	UE supporting OTDOA
6 FDD	UE supporting ECID (FDD)
6 TDD	UE supporting ECID (TDD)
7	UE supporting GNSS(1) and OTDOA
8	Void
9	Void
10	Void
11	UE supporting WLAN (Rel-13 only)
12	UE supporting MBS (Rel-13 only)
13	UE supporting Bluetooth
14	UE supporting Sensor (Rel-13 only)
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 7.3.4.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	IF sub-test 7 or 15 or 16 or 17 or 18 THEN The stored assistance data in the UE are cleared.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
1a	IF Sub-test 5 or 7 THEN The stored OTDOA assistance data in the UE are cleared.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
1b	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
1c	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
1d	IF the UE LPP message at step 1c includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
2	IF NOT sub-test 6 FDD or 6 TDD or 11 or 12 or 13 or 14 THEN The SS sends a LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
3	The SS sends a LPP message of type Request Location Information including a request for location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
-	Steps 4a1-4a2 and 4b1-4b4 represent alternative UE behaviours depending on the UE implementation	-	-	-	-
4a1 (Note 1)	All sub-tests: The UE sends a LPP message of type Provide Location Information including location measurements.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
4a2	IF the UE LPP message at step 4 a1 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4b1 (Note 2)	IF sub-test 7 THEN The UE sends a LPP message of type Provide Location Information including "early fix" location measurements.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	-	-
4b2	IF the UE LPP message at step 4b1 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4b3	The UE sends a LPP message of type Provide Location Information including location measurements.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
4b4	IF the UE LPP message at step 4b3 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

Note 1: This alternative is applicable to all releases of LPP and may be followed even in the case of sub-test 7 and LPP release 12 onwards.

Note 2: This alternative is applicable only to LPP release 12 onwards.

7.3.4.2.3.3 Specific message contents

Table 7.3.4.2.3.3-1: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.2.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-tests 7, 15: 0 0 0 0 0 0 0 0 Sub-test 16: 0 0 0 0 0 0 1 0 Sub-test 17: 0 0 0 0 0 0 1 1 Sub-test 18: 0 0 0 0 0 1 0 1	Sub-tests 7, 15: GNSS Sub-test 16: MBS Sub-test 17: WLAN Sub-test 18: Sensor	

Table 7.3.4.2.3.3-2: RESET UE POSITIONING STORED INFORMATION (step 1a, Table 7.3.4.2.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	0 0 0 0 0 0 0 1	OTDOA	

Table 7.3.4.2.3.3-3: *DLInformationTransfer* (steps 1b, 1d, 2, 3, 4a2, 4b2 and 4b4, Table 7.3.4.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.4.2.3.3-4	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.2.3.3-4: DOWNLINK GENERIC NAS TRANSPORT (steps 1b, 1d, 2, 3, 4a2, 4b2 and 4b4, Table 7.3.4.2.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1b:** Set according to Table 7.3.4.2.3.3-4a	LPP Request Capabilities.	
	Step 2: Set according to Table 7.3.4.2.3.3-5	LPP Provide Assistance Data	

	Step 3: Set according to Table 7.3.4.2.3.3-6	LPP Request Location Information	
	Steps 1d, 4a2, 4b2 and 4b4: Set according to Table 7.3.4.2.3.3-10	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.4.2.3.3-4a: LPP Request Capabilities (step 1b, Table 7.3.4.2.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.3.4.2.3.3-5: LPP Provide Assistance data (step 2, Table 7.3.4.2.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-2 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

Table 7.3.4.2.3.3-6: LPP Request Location Information (step 3, Table 7.3.4.2.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsRequired		
qos SEQUENCE {			
horizontalAccuracy	Not present		
verticalCoordinateRequest	FALSE		
verticalAccuracy	Not present		
responseTime SEQUENCE {			
time	32		
responseTimeEarlyFix-r12	Sub-tests 5, 6 FDD, 6 TDD, 11, 12, 13, 14, 15, 16, 17, 18: not present Sub-test 7: 10	Rel-12 onwards	
}			
velocityRequest	FALSE		
}			
a-gnss-RequestLocationInformation	Set according to Table 7.3.4.2.3.3-11		

Table 7.3.4.2.3.3-7: *ULInformationTransfer* (steps 1c, 4 a1, 4b1 and 4b3, Table 7.3.4.2.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.4.2.3.3-8	UPLINK GENERIC NAS TRANSPORT	
}			

nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.2.3.3-8: UPLINK GENERIC NAS TRANSPORT (steps 1c, 4 a1, 4b1 and 4b3, Table 7.3.4.2.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1c:** Set according to Table 7.3.4.2.3.3-8a	LPP Provide Capabilities	
	Steps 4 a1, 4b1 and 4b3: Set according to Table 7.3.4.2.3.3-9	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1b or 3 Table 7.3.4.2.3.2-1)	

Table 7.3.4.2.3.3-8a: LPP Provide Capabilities. (step 1c, Table 7.3.4.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1b, Table 7.3.4.2.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities SEQUENCE{	Dependent on UE capabilities		
ueRxTxSupTDD-r13	Present (TRUE) for sub-test 6 TDD	Rel-13 onwards	
}			
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.3.4.2.3.3-9: LPP Provide Location Information (steps 4 a1, 4b1 and 4b3, Table 7.3.4.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**

LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 3, Table 7.3.4.2.3.1-1	
}			
endTransaction	**Step 4a1, 4b3:** TRUE		
	Step 4b1: FALSE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation SEQUENCE {	**Step 4a1, 4b3:** May be present		
	Step 4b1: Present		
locationEstimate	Not present		
velocityEstimate	Not present		
locationError	Not present		
earlyFixReport-r12	**Step 4a1, 4b3:** Not present	Rel-12 onwards	
	Step 4b1: Any value acceptable		
}			
a-gnss-ProvideLocationInformation SEQUENCE {	**Step 4a1:** Present for sub-tests 7, 15		
	Step 4b1, 4b3: May be present	One of a-gnss-ProvideLocationInformation or otdoa-ProvideLocationInformation shall be present	
gnss-SignalMeasurementInformation SEQUENCE {	Present		
measurementReferenceTime	Present. Any value acceptable		
gnss-MeasurementList SEQUENCE (SIZE(1..n)) OF SEQUENCE {	Present. SIZE n is the number of GNSSs supported by the UE, one instance for each GNSS supported by the UE		
gnss-ID	Present		
gnss-SgnMeasList	Present, one instance for each frequency within the GNSS supported by the UE. Any value acceptable		
}			
}			
}			
gnss-LocationInformation	Not present		
gnss-Error	Not present		
}			

otdoa-ProvideLocationInformation SEQUENCE {	**Step 4a1:** Present for sub-tests 5, 7		
	Step 4b1, 4b3: May be present	One of a-gnss-ProvideLocationInformation or otdoa-ProvideLocationInformation shall be present	
otdoa-SignalMeasurementInformation	Present. Any value acceptable		
otdoa-Error	May be present		
}			
ecid-ProvideLocationInformation SEQUENCE {	Present for sub-test 6 FDD, 6 TDD.		
ecid-SignalMeasurementInformation	Present. Any value acceptable		
ecid-Error	Not present		
}			
epdu-ProvideLocationInformation	Not present		
sensor-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 14, 18	Rel-13 onwards	
sensor-MeasurementInformation-r13	Present. Any value acceptable		
sensor-Error-r13	May be present		
}			
tbs-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-tests 12, 16	Rel-13 onwards	
tbs-MeasurementInformation-r13 SEQUENCE {	Present		
measurementReferenceTime-r13	Any value acceptable		
mbs-SgnMeasList-r13	Any value acceptable		
}			
tbs-Error-r13	Not present		
}			
wlan-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 11, 17	Rel-13 onwards	
wlan-MeasurementInformation-r13	Present. Any value acceptable		
wlan-Error-r13	May be present		
}			
bt-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 13	Rel-13 onwards	
bt-MeasurementInformation-r13	Present. Any value acceptable		
bt-Error-r13	May be present		
}			
}			
}			
}			
}			
}			
}			
}			

Table 7.3.4.2.3.3-10: LPP Acknowledgement (steps 1d, 4a2, 4b2 and 4b4, Table 7.3.4.2.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**

LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 1c or 4 a1 or 4b1 or 4b3, Table 7.3.4.2.3.2-1	
}			
lpp-MessageBody	Not present.		
}			

Table 7.3.4.2.3.3-11: A-GNSS Request Location Information (step 3, Table 7.3.4.2.3.2-1)

Derivation Path: Table 5.4-4			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-4 with the following exceptions:			
multiFreqMeasReq	TRUE, if UE supports multi frequency GNSS		MultiFreqAGNSS

Condition	Description
MultiFreqAGNSS	The UE supports at least one of pc_A_GPS_L2C, pc_A_GPS_L5, pc_QZSS_QZS_L1C, pc_QZSS_QZS_L2C, pc_QZSS_QZS_L5, pc_GLONASS_G2, pc_GLONASS_G3, pc_GALILEO_E5a, pc_GALILEO_E5b, pc_GALILEO_E6, pc_GALILEO_E5aE5b, pc_BDS_B1C, pc_BDS_B2a or pc_BDS_B3I

7.3.4.3 E-SMLC Initiated Position Measurement without assistance data: UE-Based

7.3.4.3.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when {    UE has no assistance data stored and receives a location request for UE-based and the UE
            requires assistance data in order to fulfill the location request }
    then {  UE sends a REQUEST ASSISTANCE DATA message followed by a PROVIDE LOCATION INFORMATION
            message containing a location estimate }
            }
```

7.3.4.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.2.3, 5.2.4, 5.3.3 and 5.3.4.

[TS 36.355, clause 5.2.3]

When triggered to transmit a *RequestAssistanceData* message, the target device shall:

1> set the IEs for the positioning-method-specific request for assistance data to request the data indicated by upper layers.

[TS 36.355, clause 5.2.4]

Upon receiving a *ProvideAssistanceData* message, the target device shall:

1> for each positioning method contained in the message:

2> deliver the related assistance data to upper layers.

[TS 36.355, clause 5.3.3]

Upon receiving a *RequestLocationInformation* message, the target device shall:

1> if the requested information is compatible with the target device capabilities and configuration:

2> include the requested information in a *ProvideLocationInformation* message;

2> set the IE *LPP-TransactionID* in the response to the same value as the IE *LPP-TransactionID* in the received message;

2> deliver the *ProvideLocationInformation* message to lower layers for transmission.

1> otherwise:

[…]

[TS 36.355, clause 5.3.4]

When triggered to transmit *ProvideLocationInformation* message, the target device shall:

1> for each positioning method contained in the message:

2> set the corresponding IE to include the available location information;

1> deliver the response to lower layers for transmission.

7.3.4.3.3 Test description

7.3.4.3.3.1 Pre-test conditions

System Simulator:

- Cell 1.
- Satellite signals (sub-test 15): As specified in 5.2.1.
- MBS signals (sub-test 16): As specified in 5.2.4.
- WLAN signals (Sub-test 17): as specified in 5.2.5.

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- Method of triggering an LPP Request Assistance Data message.

7.3.4.3.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 7.3.4.3.3.2-0 below:

Table 7.3.4.3.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
8	Void
9	Void
10	Void
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 7.3.4.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The stored assistance data in the UE are cleared.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
1a	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
1b	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
1c	IF the UE LPP message at step 1b includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
2	The SS sends a LPP message of type Request Location Information including a request for a location estimate.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
3	The UE sends a LPP message of type Request Assistance Data including a request for assistance data. NOTE: This requires a method of triggering an Request Assistance Data message.	-->	*ULInformationTransfer* (LPP REQUEST ASSISTANCE DATA)	1	P
4	The SS sends a LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
5	The UE sends a LPP message of type Provide Location Information including a location estimate.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
5a	IF the UE LPP message at step 5 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

7.3.4.3.3.3 Specific message contents

Table 7.3.4.3.3.3-1: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.3.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 15: 0 0 0 0 0 0 0 0	Sub-test 15: GNSS Sub-test 16: MBS Sub-test 17: WLAN Sub-test 18:	

	Sub-test 16: 0 0 0 0 0 0 1 0 Sub-test 17: 0 0 0 0 0 0 1 1 Sub-test 18: 0 0 0 0 0 1 0 1	Sensor	

Table 7.3.4.3.3.3-2: *DLInformationTransfer* (steps 1a, 1c, 2, 4 and 5a, Table 7.3.4.3.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.4.3.3.3-3	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.3.3.3-3: DOWNLINK GENERIC NAS TRANSPORT (steps 1a, 1c, 2, 4 and 5a, Table 7.3.4.3.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1a:** Set according to Table 7.3.4.3.3.3-3a	LPP Request Capabilities.	
	Step 2: Set according to Table 7.3.4.3.3.3-4	LPP Request Location Information	
	Step 4: Set according to Table 7.3.4.3.3.3-9	LPP Provide Assistance Data	
	Steps 1c and 5a: Set according to Table 7.3.4.3.3.3-11	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.4.3.3.3-3a: LPP Request Capabilities (step 1a, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.3.4.3.3.3-4: LPP Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationEstimateRequired		
a-gnss-RequestLocationInformation	Set according to Table 7.3.4.3.3.3-5		Sub-test 15
sensor-RequestLocationInformation-r14	Set according to Table 7.3.4.3.3.3-5B	Rel-14 onwards	Sub-test 18
tbs-RequestLocationInformation-r13	Set according to Table 7.3.4.3.3.3-5A	Rel-13 onwards	Sub-test 16
wlan-RequestLocationInformation-r14	Set according to Table 7.3.4.3.3.3-5C	Rel-14 onwards	Sub-test 17

Table 7.3.4.3.3.3-5: A-GNSS Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-4			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-4 with the following exceptions:			
assistanceAvailability	TRUE		

Table 7.3.4.3.3.3-5A: TBS Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-7			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-7 with the following exceptions:			
mbsSgnMeasListReq-r13	FALSE (UE-based MBS)	Rel-13 onwards	
mbsAssistanceAvailability-r14	TRUE	Rel-14 onwards	

Table 7.3.4.3.3.3-5B: Sensor Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-10			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-10 with the following exceptions:			
uncompensatedBarometricPressureReq-r13	FALSE (UE-based Sensor)	Rel-13 onwards	
assistanceAvailability-r14	TRUE	Rel-14 onwards	

Table 7.3.4.3.3.3-5C: WLAN Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-8			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-8 with the following exceptions:			
requestedMeasurements-r13	bit 0 = 0 (rssi) (UE-based WLAN) bit 1 = 0 (rtt) (UE-based WLAN)	Rel-13 onwards	
assistanceAvailability-r14	TRUE	Rel-14 onwards	

Table 7.3.4.3.3.3-6: *ULInformationTransfer* (steps 1b, 3 and 5, Table 7.3.4.3.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table	UPLINK GENERIC	

	7.3.4.3.3.3-7	NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.3.3.3-7: UPLINK GENERIC NAS TRANSPORT (steps 1b, 3 and 5, Table 7.3.4.3.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1b:** Set according to Table 7.3.4.3.3.3-7a	LPP Provide Capabilities	
	Step 3: Set according to Table 7.3.4.3.3.3-8	LPP Request Assistance Data	
	Step 5: Set according to Table 7.3.4.3.3.3-10	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1a or 2 or 4 Table 7.3.4.3.3.2-1)	

Table 7.3.4.3.3.3-7a: LPP Provide Capabilities. (step 1b, Table 7.3.4.3.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1a, Table 7.3.4.3.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			

Table 7.3.4.3.3.3-8: LPP Request Assistance Data (step 3, Table 7.3.4.3.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present or not present		

ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestAssistanceData-r9 SEQUENCE {			
commonIEsRequestAssistanceData	Present or not present		
a-gnss-RequestAssistanceData	Present for sub-test 15		
otdoa-RequestAssistanceData	Not present		
epdu-RequestAssistanceData	Not present		
sensor-RequestAssistanceData-r14	Present for sub-test 18	Rel-14 onwards	
tbs-RequestAssistanceData-r14	Present for sub-test 16		
wlan-RequestAssistanceData-r14	Present for sub-test 17	Rel-14 onwards	
}			
}			
}			
}			
}			
}			

Table 7.3.4.3.3.3-9: LPP Provide Assistance Data (step 4, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Assistance Data message in step 3 Table 7.3.4.3.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {	Present if acknowledgement field is included by the UE at step 3, Table 7.3.4.3.3.2-1.		
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value as the sequenceNumber in step 3, Table 7.3.4.3.3.2-1	
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
a-gnss-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to TS 37.571-5 [12].		
sensor-ProvideAssistanceData-r14	The SS provides the assistance data requested	Rel-14 onwards	

	by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 5.4.1.5.		
tbs-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 5.4.1.3.	Rel-14 onwards	
wlan-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 5.4.1.4.	Rel-14 onwards	
}			
}			
}			
}			
}			
}			

Table 7.3.4.3.3.3-10: LPP Provide Location Information (step 5, Table 7.3.4.3.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 2, Table 7.3.4.3.3.1-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation SEQUENCE {	Present		
locationEstimate	Present. Any value acceptable		
velocityEstimate	Not present		
locationError	Not present		
earlyFixReport-r12	Not present	Rel-12 onwards	
}			
a-gnss-ProvideLocationInformation SEQUENCE {	Present for sub-test 15		
gnss-SignalMeasurementInformation	Not present		
gnss-LocationInformation	Present		

SEQUENCE {			
measurementReferenceTime	Any value acceptable		
agnss-List	Any value acceptable		
}			
gnss-Error	Not present		
}			
otdoa-ProvideLocationInformation	Not present		
ecid-ProvideLocationInformation	Not present		
epdu-ProvideLocationInformation	Not present		
sensor-ProvideLocationInformation-r13	Present for sub-test 18	Rel-13 onwards	
tbs-ProvideLocationInformation-r13	Present for sub-test 16	Rel-13 onwards	
wlan-ProvideLocationInformation-r13	Present for sub-test 17	Rel-13 onwards	
bt-ProvideLocationInformation-r13	Not present	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.3.4.3.3.3-11: LPP Acknowledgement (steps 1c and 5a, Table 7.3.4.3.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 1b or 5, Table 7.3.4.3.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

7.3.4.4 E-SMLC Initiated Position Measurement without assistance data: UE-Assisted

7.3.4.4.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when {    UE has no assistance data stored and receives a location request for UE-assisted and the
            UE requires assistance data in order to fulfill the location request }
    then {  UE sends a REQUEST ASSISTANCE DATA message followed by a PROVIDE LOCATION INFORMATION
            message containing location measurements }
            }
```

7.3.4.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.2.3, 5.2.4, 5.3.3 and 5.3.4.

[TS 36.355, clause 5.2.3]

When triggered to transmit a *RequestAssistanceData* message, the target device shall:

1> set the IEs for the positioning-method-specific request for assistance data to request the data indicated by upper layers.

[TS 36.355, clause 5.2.4]

Upon receiving a *ProvideAssistanceData* message, the target device shall:

1> for each positioning method contained in the message:

2> deliver the related assistance data to upper layers.

[TS 36.355, clause 5.3.3]

Upon receiving a *RequestLocationInformation* message, the target device shall:

1> if the requested information is compatible with the target device capabilities and configuration:

2> include the requested information in a *ProvideLocationInformation* message;

2> set the IE *LPP-TransactionID* in the response to the same value as the IE *LPP-TransactionID* in the received message;

2> deliver the *ProvideLocationInformation* message to lower layers for transmission.

1> otherwise:

[…]

[TS 36.355, clause 5.3.4]

When triggered to transmit *ProvideLocationInformation* message, the target device shall:

1> for each positioning method contained in the message:

2> set the corresponding IE to include the available location information;

1> deliver the response to lower layers for transmission.

7.3.4.4.3 Test description

7.3.4.4.3.1 Pre-test conditions

System Simulator:

- Sub-tests 15, 16, 17, 18: Cell 1.
- Sub-test 5 and 7: Cells 1 and 2, as specified in 5.2.2.
- Satellite signals (Sub-test 15): As specified in 5.2.1.
- MBS signals (Sub-test 16): As specified in 5.2.4 .
- WLAN signals (Sub-test 17): As specified in 5.2.5 .

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8].

Related PICS/PIXIT Statements:

- Method of triggering an LPP Request Assistance Data message.

7.3.4.4.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 7.3.4.4.3.2-0 below:

Table 7.3.4.4.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
5	UE supporting OTDOA
7	UE supporting GNSS(1) and OTDOA
8	Void
9	Void
10	Void
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 7.3.4.4.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	IF sub-test 7 or 15 or 16 or 17 or 18 THEN The stored assistance data in the UE are cleared.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
1a	IF Sub-test 5 or 7 THEN The stored OTDOA assistance data in the UE are cleared.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
1b	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
1c	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
1d	IF the UE LPP message at step 1c includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
2	The SS sends a LPP message of type Request Location Information including a request for location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
3	The UE sends a LPP message of type Request Assistance.NOTE: This requires a method of triggering a Request Assistance Data message.	-->	*ULInformationTransfer* (LPP REQUEST ASSISTANCE DATA)	1	P
4	The SS sends a LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
4a	IF sub-test 7 THEN the UE may send a second LPP message of type Request Assistance Data including a request for GNSS assistance data or OTDOA assistance data.	-->	*ULInformationTransfer* (LPP REQUEST ASSISTANCE DATA)	1	P
4b	IF in step 4a the UE sends a second LPP message of type Request Assistance Data THEN the SS sends a LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-

-	Steps 5a1-5a2 and 5b1-5b4 represent alternative UE behaviours depending on the UE implementation	-	-	-	-
5a1 (Note 1)	All sub-tests: The UE sends a LPP message of type Provide Location Information including location measurements.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
5a2	IF the UE LPP message at step 5a1 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
5b1 (Note 2)	IF sub-test 7 THEN The UE sends a LPP message of type Provide Location Information including "early fix" location measurements.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	-	-
5b2	IF the UE LPP message at step 5b1 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
5b3	The UE sends a LPP message of type Provide Location Information including location measurements.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
5b4	IF the UE LPP message at step 5b3 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

Note 1: This alternative is applicable to all releases of LPP and may be followed even in the case of sub-test 7 and LPP release 12 onwards.

Note 2: This alternative is applicable only to LPP release 12 onwards.

7.3.4.4.3.3 Specific message contents

Table 7.3.4.4.3.3-1: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.4.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-tests 7, 15: 0 0 0 0 0 0 0 0 Sub-test 16: 0 0 0 0 0 0 0 1 0 Sub-test 17: 0 0 0 0 0 0 0 1 1 Sub-test 18: 0 0 0 0 0 1 0 1	Sub-tests 7, 15: GNSS Sub-test 16: MBS Sub-test 17: WLAN Sub-test 18: Sensor	

Table 7.3.4.4.3.3-2: RESET UE POSITIONING STORED INFORMATION (step 1a, Table 7.3.4.4.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	0 0 0 0 0 0 0 1	OTDOA	

Table 7.3.4.4.3.3-3: *DLInformationTransfer* (steps 1b, 1d, 2, 4, 4b, 5a2, 5b2 and 5b4, Table 7.3.4.4.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			

rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.4.4.3.3-4	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.4.3.3-4: DOWNLINK GENERIC NAS TRANSPORT (steps 1b, 1d, 2, 4, 4b, 5a2, 5b2 and 5b4, Table 7.3.4.4.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator		EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1b:** Set according to Table 7.3.4.4.3.3-4a	LPP Request Capabilities	
	Step 2: Set according to Table 7.3.4.4.3.3-5	LPP Request Location Information	
	Steps 4 and 4b: Set according to Table 7.3.4.4.3.3-10	LPP Provide Assistance Data	
	Steps 1d, 5a2, 5b2 and 5b4: Set according to Table 7.3.4.4.3.3-12	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.4.4.3.3-4a: LPP Request Capabilities (step 1b, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.3.4.4.3.3-5: LPP Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsRequired		
a-gnss-RequestLocationInformation	Set according to Table 7.3.4.4.3.3-6		Sub-tests 7, 15
otdoa-RequestLocationInformation	Set according to Table 7.3.4.4.3.3-6a		Sub-test 5, 7

qos SEQUENCE {			
horizontalAccuracy	Not present		
verticalCoordinateRequest	FALSE		
verticalAccuracy	Not present		
responseTime SEQUENCE {			
time	32		
responseTimeEarlyFix-r12	Sub-tests 5, 15, 16: not present Sub-test 7: 10	Rel-12 onwards	
}			
velocityRequest	FALSE		
}			
sensor-RequestLocationInformation-r14	Set according to Table 7.3.4.4.3.3-6c	Rel-14 onwards	Sub-test 18
tbs-RequestLocationInformation-r13	Set according to Table 7.3.4.4.3.3-6b	Rel-13 onwards	Sub-test 16
wlan-RequestLocationInformation-r14	Set according to Table 7.3.4.4.3.3-6d	Rel-14 onwards	Sub-test 17

Table 7.3.4.4.3.3-6: A-GNSS Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-4			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-4 with the following exceptions:			
assistanceAvailability	TRUE		
multiFreqMeasReq	TRUE, if UE supports multi frequency GNSS		MultiFreqAGNSS

Condition	Description
MultiFreqAGNSS	The UE supports at least one of pc_A_GPS_L2C, pc_A_GPS_L5, pc_QZSS_QZS_L1C, pc_QZSS_QZS_L2C, pc_QZSS_QZS_L5, pc_GLONASS_G2, pc_GLONASS_G3, pc_GALILEO_E5a, pc_GALILEO_E5b, pc_GALILEO_E6, pc_GALILEO_E5aE5b, pc_BDS_B1C, pc_BDS_B2a or pc_BDS_B3I

Table 7.3.4.4.3.3-6a: OTDOA Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-5			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-5 with the following exceptions:			
assistanceAvailability	TRUE		

Table 7.3.4.4.3.3-6b: TBS Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-7			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-7 with the following exceptions:			
mbsAssistanceAvailability-r14	TRUE	Rel-14 onwards	

Table 7.3.4.4.3.3-6c: Sensor Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-10			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-10 with the following exceptions:			
assistanceAvailability-r14	TRUE	Rel-14 onwards	

Table 7.3.4.4.3.3-6d: WLAN Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-8			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-8 with the following exceptions:			
assistanceAvailability-r14	TRUE	Rel-14 onwards	

Table 7.3.4.4.3.3-7: *ULInformationTransfer* (steps 1c, 3, 4a, 5a1, 5b1 and 5b3, Table 7.3.4.4.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.4.4.3.3-8	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.4.4.3.3-8: UPLINK GENERIC NAS TRANSPORT (steps 1c, 3, 4a, 5a1, 5b1 and 5b3, Table 7.3.4.4.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1c:** Set according to Table 7.3.4.4.3.3-8a	LPP Provide Capabilities	
	Steps 3 and 4a: Set according to Table 7.3.4.4.3.3-9	LPP Request Assistance Data	
	Steps 5a1, 5b1 and 5b3: Set according to Table 7.3.4.4.3.3-11	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1b, 2 or 4 Table 7.3.4.4.3.2-1)	

Table 7.3.4.4.3.3-8a: LPP Provide Capabilities. (step 1c, Table 7.3.4.4.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1b, Table 7.3.4.4.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			

Table 7.3.4.4.3.3-9: LPP Request Assistance Data (steps 3 and 4a, Table 7.3.4.4.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present or not present		

ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestAssistanceData-r9 SEQUENCE {			
commonIEsRequestAssistanceData	Present or not present		
a-gnss-RequestAssistanceData	Present for sub-tests 7, 15	For sub-test 7, in case the UE sends two separate LPP Request Assistance Data messages in steps 3 and 4a then one contains a-gnss-RequestAssistance Data and the other contains otdoa-RequestAssistance Data	
otdoa-RequestAssistanceData	Present for sub-test 5,7	For sub-test 7, in case the UE sends two separate LPP Request Assistance Data messages in steps 3 and 4a then one contains a-gnss-RequestAssistance Data and the other contains otdoa-RequestAssistance Data	
epdu-RequestAssistanceData	Not present		
sensor-RequestAssistanceData-r14	Present for sub-test 18	Rel-14 onwards	
tbs-RequestAssistanceData-r14	Present for sub-test 16	Release 14 onwards	
wlan-RequestAssistanceData-r14	Present for sub-test 17	Rel-14 onwards	
}			
}			
}			
}			
}			
}			

Table 7.3.4.4.3.3-10: LPP Provide Assistance Data (steps 4 and 4b, Table 7.3.4.4.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Assistance Data message in step 3 or 4a Table 7.3.4.4.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	Not present		

acknowledgement SEQUENCE {	Present if acknowledgement field is included by the UE at step 3 or 4a, Table 7.3.4.4.3.2-1.		
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value as the sequenceNumber in step 3 or 4a, Table 7.3.4.4.3.2-1.	
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
a-gnss-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 3 or 4a, Table 7.3.4.4.3.2-1 which are available according to TS 37.571-5 [12].	For sub-test 7, in case the UE sends two separate LPP Request Assistance Data messages in steps 3 and 4a then the SS sends two seperate LPP Provide Assistance Data messages in steps 4 and 4b each containing the relevant assistance data.	Sub-tests 7, 15
otdoa-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 3 or 4a, Table 7.3.4.4.3.2-1 according to subclause 5.4.1.2.	For sub-test 7, in case the UE sends two separate LPP Request Assistance Data messages in steps 3 and 4a then the SS sends two seperate LPP Provide Assistance Data messages in steps 4 and 4b each containing the relevant assistance data.	Sub-tests 5,7
sensor-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 5.4.1.5.	Release 14 onwards	Sub-test 18
tbs-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 5.4.1.3.	Release 14 onwards	Sub-test 16
wlan-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 5.4.1.4.	Release 14 onwards	Sub-test 17
}			
}			

}			
}			
}			
}			

Table 7.3.4.4.3.3-11: LPP Provide Location Information (steps 5a1, 5b1 and 5b3, Table 7.3.4.4.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**

LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 2, Table 7.3.4.4.3.1-1	
}			
endTransaction	**Step 5a1, 5b3:** TRUE		
	Step 5b1: FALSE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation SEQUENCE {	**Step 5a1, 5b3:** May be present		
	Step 5b1: Present		
locationEstimate	Not present		
velocityEstimate	Not present		
locationError	Not present		
earlyFixReport-r12	**Step 5a1, 5b3:** Not present	Rel-12 onwards	
	Step 5b1: Any value acceptable		
}			
a-gnss-ProvideLocationInformation SEQUENCE {	**Step 5a1:** Present for sub-tests 7, 15		
	Step 5b1, 5b3: May be present	One of a-gnss-ProvideLocationInformation or otdoa-ProvideLocationInformation shall be present	
gnss-SignalMeasurementInformation SEQUENCE {	Present		
measurementReferenceTime	Present. Any value acceptable		
gnss-MeasurementList SEQUENCE (SIZE(1..n)) OF SEQUENCE {	Present. SIZE n is the number of GNSSs supported by the UE, one instance for each GNSS supported by the UE		
gnss-ID	Present		
gnss-SgnMeasList	Present, one instance for each frequency within the GNSS supported by the UE. Any value acceptable		
}			
}			
}			
gnss-LocationInformation	Not present		
gnss-Error	Not present		
}			

otdoa-ProvideLocationInformation SEQUENCE {	**Step 5a1:** Present for sub-tests 5, 7		
	Step 5b1, 5b3: May be present	One of a-gnss-ProvideLocationInformation or otdoa-ProvideLocationInformation shall be present	
otdoa-SignalMeasurementInformation	Present. Any value acceptable		
otdoa-Error	May be present		
}			
ecid-ProvideLocationInformation	Not present		
epdu-ProvideLocationInformation	Not present		
sensor-ProvideLocationInformation-r13	Present for sub-test 18	Rel-13 onwards	
tbs-ProvideLocationInformation-r13	Present for sub-test 16	Rel-13 onwards	
wlan-ProvideLocationInformation-r13	Present for sub-test 17	Rel-13 onwards	
bt-ProvideLocationInformation-r13	Not present	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.3.4.4.3.3-12: LPP Acknowledgement (steps 1d, 5a2, 5b2 and 5b4, Table 7.3.4.4.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 1c or 5a1 or 5b1 or 5b3, Table 7.3.4.4.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

7.3.5 LPP Abort

7.3.5.1 E-SMLC initiated Abort

7.3.5.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing }
ensure that {
  when { UE receives a LPP Abort message carrying the transaction ID of an on-going procedure }
    then { UE aborts the on-going procedure }
            }
```

7.3.5.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355, clause 5.5.3.

[TS 36.355, clause 5.5.3]

Upon receiving an *Abort* message, a device shall:

1> abort any ongoing procedure associated with the transaction ID indicated in the message.

7.3.5.1.3 Test description

7.3.5.1.3.1 Pre-test conditions

System Simulator:

- Sub-tests 11, 12, 13, 15, 16, 17: Cell 1.
- Sub-test 5: Cell 1 as specified in 5.2.2.

UE:

- The UE shall begin the tests with no assistance data stored.

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP TS 36.508 [8].

Related PICS/PIXIT Statements:

-

7.3.5.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 7.3.5.1.3.2-0 below:

Table 7.3.5.1.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
5	UE supporting OTDOA
8	Void
9	Void
10	Void
11	UE supporting WLAN (Rel-13 only)
12	UE supporting MBS (Rel-13 only)
13	UE supporting Bluetooth
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Note that this test case does not include a sub-test for the case where ECID or Sensor is supported by the UE as the behaviour required cannot be guaranteed in these cases.

Table 7.3.5.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
00	The SS sends a RESET UE POSITIONING STORED INFORMATION message.	**<--**	RESET UE POSITIONING STORED INFORMATION	**-**	**-**
0	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
0a	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
0b	IF the UE LPP message at step 0a includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
0c	IF NOT Sub-test 11 or 12 or 13 THEN The SS sends a LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)		
1	The SS sends a LPP message of type Request Location Information including a transaction ID.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
2	Immediately after step 1, the SS sends a LPP message of type Abort using the same transaction ID chosen in step 1.	<--	*DLInformationTransfer* (LPP ABORT)	-	-
3	The SS waits for 10 seconds to ensure the UE does not send a LPP message of type Provide Location Information with the same transaction ID as in step 1.			1	P

7.3.5.1.3.3 Specific message contents

Table 7.3.5.1.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 00, Table 7.3.5.1.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-tests 15: 0 0 0 0 0 0 0 0 Sub-test 5: 0 0 0 0 0 0 0 1 Sub-test 11, 17: 0 0 0 0 0 0 1 1 Sub-tests 12, 16: 0 0 0 0 0 0 1 0 Sub-test 13: 0 0 0 0 0 1 0 0	Sub-tests 15: AGNSS Sub-test 5: OTDOA Sub-test 11, 17: WLAN Sub-tests 12, 16: MBS Sub-test 13: Bluetooth	

Table 7.3.5.1.3.3-1: *DLInformationTransfer* (steps 0, 0b, 0c, 1 and 2, Table 7.3.5.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.5.1.3.3-2	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.5.1.3.3-2: DOWNLINK GENERIC NAS TRANSPORT (steps 0, 0b, 0c, 1 and 2, Table 7.3.5.1.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 0:** Set according to Table 7.3.5.1.3.3-2a	LPP Request Capabilities.	
	Step 0b: Set according to Table 7.3.5.1.3.3-2b	LPP Acknowledgement	
	Step 0c: Set according to Table 7.3.5.1.3.3-2c	LPP Provide Assistance Data	
	Step 1: Set according to Table 7.3.5.1.3.3-3	LPP Request Location Information	
	Step 2: Set according to Table 7.3.5.1.3.3-4	LPP Abort	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.3.5.1.3.3-2a: LPP Request Capabilities (step 0, Table 7.3.5.1.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.3.5.1.3.3-2b: LPP Acknowledgement (step 0b, Table 7.3.5.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 0a, Table 7.3.5.1.3.2-1.	
}			
lpp-MessageBody	Not present.		
}			

Table 7.3.5.1.3.3-2c: LPP Provide Assistance Data (step 0c, Table 7.3.5.1.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-2 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			
OTDOA-NeighbourCellInfoList ::= SEQUENCE (SIZE(1)) OF SEQUENCE {			Sub-test 5
SEQUENCE (SIZE(18)) OF SEQUENCE {	Sequence contains 18 instances of the following data.		
physCellId	Refer to Sequence data values in Table 7.3.5.1.3.3-2d		
cellGlobalId	For values of cellidentity refer to Sequence data values in Table 7.3.5.1.3.3-2d		
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Same as for the reference cell	
prs-SubframeOffset	Not present	Same as for the reference cell	
expectedRSTD	Refer to Sequence data values in Table 7.3.5.1.3.3-2d		
expectedRSTD-Uncertainty	Refer to Sequence data values in Table 7.3.5.1.3.3-2d		
earfcn-v9a0	Not present	Same as for the reference cell	
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Not present	Not required	Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
}			
}			

Table 7.3.5.1.3.3-2d: Sequence data values for 18 instances of sequence for Table 7.3.5.1.3.3-2c

Cell	Value physCellId	Value cellidentity (E-UTRAN Cell Identity)		Value expectedRSTD	Value expectedRSTD-Uncertainty	Comment
		Value eNB ID	Value Cell Identity			
Cell 2	2	'0000 0000 0000 0000 0001'B	'0000 0010'B	8192	10	As defined for Cell 2 in 36.508 [8]
Cell 4	4	'0000 0000 0000 0000 0011'B	‘0000 0100’B	8192	10	As defined for Cell 4 in 36.508 [8]
Dummy cell	1	'0000 0000 0000 0000 0001'B	'0000 0001'B	8253	51	
Dummy cell	3	'0000 0000 0000 0000 0010'B	'0000 0011'B	8211	51	
Dummy cell	6	'0000 0000 0000 0000 0100'B	'0000 0110'B	8221	51	
Dummy cell	7	'0000 0000 0000 0000 0110'B	‘0000 0111’B	8192	51	
Dummy cell	8	'0000 0000 0000 0000 0010'B	'0000 1000'B	8233	51	
Dummy cell	9	'0000 0000 0000 0000 0100'B	‘0000 1001’B	8161	51	
Dummy cell	10	'0000 0000 0000 0000 0101'B	'0000 1010'B	8226	51	
Dummy cell	11	'0000 0000 0000 0000 0110'B	'0000 1011'B	8232	51	
Dummy cell	16	'0000 0000 0000 0000 0010'B	'0001 0000'B	8223	51	
Dummy cell	111	'0000 0000 0000 0000 1100'B	'0110 1111'B	8236	51	
Dummy cell	118	'0000 0000 0000 0000 1111'B	‘0111 0110’B	8223	51	
Dummy cell	119	'0000 0000 0000 0000 1110'B	‘0111 0111’B	8221	51	
Dummy cell	120	'0000 0000 0000 0000 1111'B	‘0111 1000’B	8223	51	
Dummy cell	122	'0000 0000 0000 0000 1010'B	‘0111 1010’B	8243	51	
Dummy cell	125	'0000 0000 0000 0000 1011'B	‘0111 1101’B	8253	51	
Dummy cell	126	'0000 0000 0000 0000 1100'B	‘0111 1110’B	8257	51	

Table 7.3.5.1.3.3-3: LPP Request Location Information (step 1, Table 7.3.5.1.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	0		
}			
locationInformationType	locationEstimateRequired	In case of "UE-based" Location method supported by the UE	
	locationMeasurementsRequired	In case of "UE-assisted" Location method supported by the UE	
time	10		

Table 7.3.5.1.3.3-4: LPP Abort (step 2, Table 7.3.5.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	0		
}			
endTransaction	TRUE		
sequenceNumber	Not present.		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
abort SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
abort-r9 SEQUENCE {			
commonIEsAbort SEQUENCE {			
abortCause	networkAbort		
}			
epdu-Abort	Not present		
}			
}			
}			
}			
}			
}			

Table 7.3.5.1.3.3-5: *ULInformationTransfer* (step 0a, Table 7.3.5.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.3.5.1.3.3-6	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.3.5.1.3.3-6: UPLINK GENERIC NAS TRANSPORT (step 0a, Table 7.3.5.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	Set according to Table 7.3.5.1.3.3-7	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 0 Table 7.3.5.1.3.2-1)	

Table 7.3.5.1.3.3-7: LPP Provide Capabilities. (step 0a, Table 7.3.5.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 0, Table 7.3.5.1.3.2-1.	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			

7.4 Circuit Switched (CS) Fallback

7.4.1 MO-LR Procedure

7.4.1.1 CS fallback: Network does not support EPC-MO-LR

7.4.1.1.1 Test Purpose (TP)

(1)

```
with { UE in E-UTRA RRC_IDLE state having received an ATTACH ACCEPT message indicating location
       services via EPC not supported and location services via CS domain supported }
ensure that {
  when { UE initiates MO-LR procedure }
    then { UE transmits an EXTENDED SERVICE REQUEST message }
           }
```

7.4.1.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause 8.3.1.

[TS 23.272, clause 8.3.1]

MO-LR procedure in the CS fallback in EPS is performed as specified in TS 23.271 [8].

When the MO-LR procedure is triggered by the UE's application, UE will check the LCS Support Indication provided by the Attach and TAU procedures as specified in TS 23.401 [2]:

- If the LCS Support Indication indicates EPC-MO-LR is supported, and if the UE supports EPC-MO-LR, the UE stays in LTE and initiates the EPC-MO-LR procedure.

- If EPC-MO-LR is not supported by either the network or the UE and if the LCS Support Indication indicates CS-MO-LR is supported, and the UE supports CS-MO-LR, the UE assumes CS-MO-LR is provided. Also, if EPC-MO-LR is not supported by either the network or the UE and if network does not provide information on whether CS-MO-LR is supported, then UE assumes CS-MO-LR may be provided. In these cases, if the previous combined EPS/IMSI Attach or Combined TA/LA Update is accepted with no "SMS only" indication, then the UE initiates CS Fallback to perform CS-MO-LR.

NOTE: Based on UE implementation, UE may avoid initiating CS-MO-LR when an IMS VoIP session is active.

- Otherwise, the UE shall not attempt the EPC-MO-LR procedure, i.e. neither EPC-MO-LR nor CS-MO-LR with CS Fallback.

If the UE decided to initiate the CS Fallback for the LCS based on LCS Support Indication check, then, the following is applied:

- When UE is in active mode, UE and the network follows the procedure in clause 6.2 "Mobile Originating Call in Active-Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedures as specified in TS 23.271 [8].

- When UE is in active mode but there's no need for PS-Handover, then UE and the network follows the procedure in clause 6.3 "Mobile Originating Call in Active Mode - No PS HO Support in GERAN". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].

- When UE is in idle mode, UE follows the procedure in clause 6.4 "Mobile Originating Call in Idle Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].

7.4.1.1.3 Test description

7.4.1.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 (E-UTRA) and Cell 5 (UTRA)
- System information combination 4 as defined in TS 36.508 [8] clause 4.4.3.1 is applied to cell 1.

Table 7.4.1.1.3.1-1: Cell power levels

Parameter	Unit	Cell1	Cell 5	Remark
Cell-specific RS EPRE	dBm/15kHz	-75	-	The power levels are such that the UE camps on cell 1.
CPICH_Ec	dBm/3.84 MHz	-	-70	

UE:

- The UE is configured to initiate combined EPS/IMSI attach.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on cell 1 according to TS 36.508 [8] During the registration procedure, the LAI of cell 5 is allocated to the UE.

Related PICS/PIXIT Statements:

- Method of triggering a CS-MO-LR request for a location estimate.

7.4.1.1.3.2 Test procedure sequence

Table 7.4.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Cause the UE to initiate MO-LR procedure.	-	-	-	-
2	The UE transmits an *RRCConnectionRequest* message on Cell 1.	-->	*RRCConnectionRequest*	-	-
3	The SS transmits an *RRCConnectionSetup* message on Cell 1.	<--	*RRCConnectionSetup*	-	-
4	The UE transmits an *RRCConnectionSetupComplete* message on Cell 1. This message includes an EXTENDED SERVICE REQUEST message.	-->	*RRCConnectionSetupComplete*	1	P
5	The SS transmits an *RRCConnectionRelease* message for redirection to UTRAN carrier on Cell 5.	<--	*RRCConnectionRelease*	-	-
6-14	Steps 1 to 6 and steps 10 to 12 of the test procedure in subclause 6.1.2.1 are performed on Cell 5. Note: RRC connection establishment procedure and LCS procedure are performed in UTRAN cell.	-	-	-	-

7.4.1.1.3.3 Specific message contents

Table 7.4.1.1.3.3-1: SystemInformationBlockType6 for cell 1 (preamble, table 7.4.1.1.3.2-1)

Derivation path: 36.508 table 4.4.3.3-5			
Information Element	**Value/Remark**	**Comment**	**Condition**
SystemInformationBlockType6 ::= SEQUENCE {			
carrierFreqListUTRA-FDD SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			FDD
carrierFreq[n]	Same as cell 5		
cellReselectionPriority[n]	3	Lower than cell 1 priority (priority = 4)	
}			
carrierFreqListUTRA-TDD SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {	1 entry		TDD
carrierFreq[n]	Same as cell 5		
cellReselectionPriority[n]	3	Lower than cell 1 priority (priority = 4)	
}			
}			

Table 7.4.1.1.3.3-2: Message ATTACH ACCEPT (preamble, Table 7.4.1.1.3.2-1)

Derivation Path: TS 36.508 Table 4.7.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
Location services indicator in EPC (EPC-LCS)	0	location services via EPC not supported	
Location services indicator in CS (CS-LCS)	01	location services via CS domain supported	

Table 7.4.1.1.3.3-3: EXTENDED SERVICE REQUEST (step 4, table 13.1.2.3.2-1)

Derivation path: 36.508 table 4.7.2-14A			
Information Element	**Value/Remark**	**Comment**	**Condition**
Service type	0000 'mobile originating CS fallback or 1xCS fallback'		
CSFB response	Not present		
EPS bearer context status	Not present or any allowed value		

Table 7.4.1.1.3.3-4: Message *RRCConnectionRelease* (step 5, Table 7.4.1.1.3.2-1)

Derivation Path: TS 36.508 Table 4.6.1-15			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
redirectedCarrierInfo CHOICE {			
utra-FDD	Downlink UARFCN of cell 5		UTRA-FDD
utra-TDD	Downlink UARFCN of cell 5		UTRA-TDD
}			
}			
}			
}			
}			

Condition	Explanation

UTRA-FDD	UTRA FDD cell environment
UTRA-TDD	UTRA TDD cell environment

Table 7.4.1.1.3.3-5: Message FACILITY (step 6, Table 7.4.1.1.3.2-1)

Derivation Path: 24.080 Table 2.3			
Information Element	**Value/remark**	**Comment**	**Condition**
Supplementary service protocol discriminator	1011	supplementary services (call independent)	
Transaction identifier			
Facility message type	0011 1010	FACILITY	
Facility	Return Result=LCS-MOLRRes	Set according to Table 7.4.1.1.3.3-6	

Table 7.4.1.1.3.3-6: LCS-MOLRRes (step 6, Table 7.2.2.2.3.2-1)

Derivation Path: 24.080 clause 4.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LCS-MOLRRes::= SEQUENCE {			
locationEstimate	'90D6B9D6B860B800300 220430144'O	Ellipsoid point with altitude and uncertainty Ellipsoid = 9 Spare = 0 Degrees of latitude = D6B9D6 Degrees of longitude = B860B8 Altitude =0030 Uncertainty semi-major= 02 Uncertainty semi-minor =20 Orientation of major axis =43 Uncertainty Altitude= 01 Confidence=44	
}			

7.4.1.2 CS fallback: UE does not support EPC-MO-LR

7.4.1.2.1 Test Purpose (TP)

(1)

```
with {  UE in E-UTRA RRC_IDLE state having received an ATTACH ACCEPT message indicating location
        services via EPC supported and location services via CS domain supported }
ensure that {
  when { UE initiates MO-LR procedure }
    then { UE transmits an EXTENDED SERVICE REQUEST message }
           }
```

7.4.1.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 23.272, clause 8.3.1.

[TS 23.272, clause 8.3.1]

MO-LR procedure in the CS fallback in EPS is performed as specified in TS 23.271 [8].

When the MO-LR procedure is triggered by the UE's application, UE will check the LCS Support Indication provided by the Attach and TAU procedures as specified in TS 23.401 [2]:

- If the LCS Support Indication indicates EPC-MO-LR is supported, and if the UE supports EPC-MO-LR, the UE stays in LTE and initiates the EPC-MO-LR procedure.

- If EPC-MO-LR is not supported by either the network or the UE and if the LCS Support Indication indicates CS-MO-LR is supported, and the UE supports CS-MO-LR, the UE assumes CS-MO-LR is provided. Also, if EPC-MO-LR is not supported by either the network or the UE and if network does not provide information on whether CS-MO-LR is supported, then UE assumes CS-MO-LR may be provided. In these cases, if the previous combined EPS/IMSI Attach or Combined TA/LA Update is accepted with no "SMS only" indication, then the UE initiates CS Fallback to perform CS-MO-LR.

NOTE: Based on UE implementation, UE may avoid initiating CS-MO-LR when an IMS VoIP session is active.

- Otherwise, the UE shall not attempt the EPC-MO-LR procedure, i.e. neither EPC-MO-LR nor CS-MO-LR with CS Fallback.

If the UE decided to initiate the CS Fallback for the LCS based on LCS Support Indication check, then, the following is applied:

- When UE is in active mode, UE and the network follows the procedure in clause 6.2 "Mobile Originating Call in Active-Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedures as specified in TS 23.271 [8].

- When UE is in active mode but there's no need for PS-Handover, then UE and the network follows the procedure in clause 6.3 "Mobile Originating Call in Active Mode - No PS HO Support in GERAN". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].

- When UE is in idle mode, UE follows the procedure in clause 6.4 "Mobile Originating Call in Idle Mode". After UE changes its RAT from E-UTRAN to UTRAN/GERAN, it performs CS-MO-LR procedure as specified in TS 23.271 [8].

7.4.1.2.3 Test description

7.4.1.2.3.1 Pre-test conditions

System Simulator:

- Cell 1 (E-UTRA) and Cell 5 (UTRA)

- System information combination 4 as defined in TS 36.508 [8] clause 4.4.3.1 is applied to cell 1.

Table 7.4.1.2.3.1-1: Cell power levels

Parameter	Unit	Cell1	Cell 5	Remark
Cell-specific RS EPRE	dBm/15kHz	-75	-	The power levels are such that the UE camps on cell 1.
CPICH_Ec	dBm/3.84 MHz	-	-70	

UE:

- The UE is configured to initiate combined EPS/IMSI attach.

Preamble:

- The UE is in state Registered, Idle Mode (state 2) on cell 1 according to TS 36.508 [8] During the registration procedure, the LAI of cell 5 is allocated to the UE related PICS/PIXIT Statements:

- Method of triggering a CS-MO-LR request for a location estimate.

7.4.1.2.3.2 Test procedure sequence

Table 7.4.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Cause the UE to initiate MO-LR procedure.	-	-	-	-
2	The UE transmits an *RRCConnectionRequest* message on Cell 1.	-->	*RRCConnectionRequest*	-	-
3	The SS transmits an *RRCConnectionSetup* message on Cell 1.	<--	*RRCConnectionSetup*	-	-
4	The UE transmits an *RRCConnectionSetupComplete* message on Cell 1. This message includes an EXTENDED SERVICE REQUEST message.	-->	*RRCConnectionSetupComplete*	1	P
5	The SS transmits an *RRCConnectionRelease* message for redirection to UTRAN carrier on Cell 5.	<--	*RRCConnectionRelease*	-	-
6-14	Steps 1 to 6 and steps 10 to 12 of the test procedure in subclause 6.1.2.1 are performed on Cell 5. Note: RRC connection establishment procedure and LCS procedure are performed in UTRAN cell.	-	-	-	-

7.4.1.2.3.3 Specific message contents

Table 7.4.1.2.3.3-1: SystemInformationBlockType6 for cell 1 (preamble, table 7.4.1.2.3.2-1)

Same content as Table 7.4.1.1.3.3-1

Table 7.4.1.2.3.3-2: Message ATTACH ACCEPT (preamble, Table 7.4.1.2.3.2-1)

Derivation Path: TS 36.508 Table 4.7.2-1			
Information Element	**Value/remark**	**Comment**	**Condition**
Location services indicator in EPC (EPC-LCS)	1	location services via EPC supported	
Location services indicator in CS (CS-LCS)	01	location services via CS domain supported	

Table 7.4.1.2.3.3-3: EXTENDED SERVICE REQUEST (step 4, table 13.1.2.3.2-1)

Derivation path: 36.508 table 4.7.2-14A			
Information Element	**Value/Remark**	**Comment**	**Condition**
Service type	0000 'mobile originating CS fallback or 1xCS fallback'		
CSFB response	Not present		
EPS bearer context status	Not present or any allowed value		

Table 7.4.1.2.3.3-4: Message *RRCConnectionRelease* (step 5, Table 7.4.1.2.3.2-1)

Derivation Path: TS 36.508 Table 4.6.1-15			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionRelease ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
rrcConnectionRelease-r8 SEQUENCE {			
redirectedCarrierInfo CHOICE {			
utra-FDD	Downlink UARFCN of cell 5		UTRA-FDD
utra-TDD	Downlink UARFCN of cell 5		UTRA-TDD
}			
}			
}			
}			
}			

Condition	Explanation
UTRA-FDD	UTRA FDD cell environment
UTRA-TDD	UTRA TDD cell environment

Table 7.4.1.2.3.3-5: Message *FACILITY* (step 6, Table 7.4.1.2.3.2-1)

same content as Table 7.4.1.1.3.3-5

7.5 RRC Protocol Procedures

7.5.1 Inter-frequency RSTD measurement indication

7.5.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when {    the UE receives OTDOA assistance data including inter-frequency cells together with
            a location request for OTDOA }
    then { the UE initiates the RRC Inter-frequency RSTD measurement procedure to indicate
 “start”.}
}
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
  when { the UE stops reporting inter-frequency RSTD measurements }
    then { the UE initiates the RRC Inter-frequency RSTD measurement procedure to indicate
 “stop”. }
}
```

7.5.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 36.355 clauses 6.5.1.2, 6.5.1.5, and TS 36.331 clauses 5.5.7.2, 5.7.7.3.

[TS 36.355, clause 6.5.1.2]

If inter-frequency neighbour cells are included in *OTDOA-NeighbourCellInfoList*, where an inter-frequency is a E-UTRA frequency which is different from the E-UTRA serving cell frequency, the LPP layer shall inform lower layers to start performing inter-frequency RSTD measurements for these neighbour cells and also provide to lower layers the information about these neighbour cells, e.g. EARFCN and PRS positioning occasion information.

[TS 36.355, clause 6.5.1.5]

If the target device stops reporting inter-frequency RSTD measurements, where the inter-frequency RSTD measurement is an OTDOA RSTD measurement with at least one cell on a frequency different from the serving cell frequency, the LPP layer shall inform lower layers that inter-frequency RSTD measurements are stopped.

[TS 36.331, clause 5.5.7.2]

The UE shall:

1> if and only if upper layers indicate to start performing inter-frequency RSTD measurements; and the UE requires measurement gaps for these measurements while measurement gaps are either not configured or not sufficient:

2> initiate the procedure to indicate start;

NOTE 1: The UE verifies the measurement gap situation only upon receiving the indication from upper layers. If at this point in time sufficient gaps are available, the UE does not initiate the procedure. Unless it receives a new indication from upper layers, the UE is only allowed to further repeat the procedure in the same PCell once per frequency if the provided measurement gaps are insufficient.

1> if and only if upper layers indicate to stop performing inter-frequency RSTD measurements:

2> initiate the procedure to indicate stop;

NOTE 2: The UE may initiate the procedure to indicate stop even if it did not previously initiate the procedure to indicate start.

[TS 36.331, clause 5.5.7.3]

The UE shall set the contents of *InterFreqRSTDMeasurementIndication* message as follows:

1> set *the rstd-InterFreqIndication* as follows:

2> if the procedure is initiated to indicate start of inter-frequency RSTD measurements:

3> set the *rstd-InterFreqInfoList* according to the information received from upper layers;

2> else if the procedure is initiated to indicate stop of inter-frequency RSTD measurements:

3> set the rstd-InterFreqIndication to the value stop;

1> submit the *InterFreqRSTDMeasurementIndication* message to lower layers for transmission, upon which the procedure ends;

7.5.1.3 Test description

7.5.1.3.1 Pre-test conditions

System Simulator:

- Cell 1 as specified in 5.2.2.

UE:

-

Preamble:

- The UE is in state Generic RB Established (state 3) according to 3GPP 36.508 [8] (no measurement gaps are configured).

Related PICS/PIXIT Statements:

- Support for inter-frequency RSTD measurements that require measurement gaps for these measurements.

7.5.1.3.2 Test procedure sequence

Table 7.5.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The stored OTDOA assistance data in the UE are cleared.	<--	RESET UE POSITIONING STORED INFORMATION	-	-
1a	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
1b	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
1c	IF the UE LPP message at step 1b includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
-	EXCEPTION: In parallel to the events described in Steps 2 to 6, the steps specified in Table 7.5.1.3.2-2 take place				
2	The SS sends a LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
3-5	Void				
6	The SS sends a LPP message of type Request Location Information including a request for OTDOA location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
-	EXCEPTION: In parallel with the events described in Steps 7 to 10, the steps specified in Table 7.5.1.3.2-3 take place.				
7	The UE sends a LPP message of type Provide Location Information.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	-	-
7a	IF the UE LPP message at step 7 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
8-10	Void				

Table 7.5.1.3.2-2: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE transmits an RRC *InterFreqRSTDMeasurementIndication* message to indicate “start”	-->	*InterFreqRSTDMeasurementIndication*	1	P
2	The SS transmits an *RRCConnectionReconfiguration* message to set up the measurement gap configuration	<--	*RRCConnectionReconfiguration*	-	-
3	The UE transmits an *RRCConnectionReconfigurationComplete* message to confirm the set up of the measurement gap configuration	-->	*RRCConnectionReconfigurationComplete*	-	-

Table 7.5.1.3.2-3: Parallel behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE transmits an RRC *InterFreqRSTDMeasurementIndication* message to indicate “stop”	-->	*InterFreqRSTDMeasurementIndication*	2	P
2	The SS transmits an *RRCConnectionReconfiguration* message to release the measurement gap configuration	<--	*RRCConnectionReconfiguration*	-	-
3	The UE transmits an *RRCConnectionReconfigurationComplete* message to confirm the release of the measurement gap configuration	-->	*RRCConnectionReconfigurationComplete*	-	-

7.5.1.3.3 Specific message contents

For the default message content as specified in subclause 5.4, the values for sub-test 5 are used.

Table 7.5.1.3.3-1: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.5.1.3.2-1)

Derivation Path: 36.509 clause 6.9			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	0 0 0 0 0 0 0 1	OTDOA	

Table 7.5.1.3.3-2: *DLInformationTransfer* (steps 1a, 1c, 2, 6 and 7a, Table 7.5.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
c1 CHOICE {			
dlInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.5.1.3.3-3	DOWNLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.5.1.3.3-3: DOWNLINK GENERIC NAS TRANSPORT (steps 1a, 1c, 2, 6 and 7a, Table 7.5.1.3.2-1)

Derivation Path: 24.301 Table 8.2.31.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Downlink generic NAS transport message identity	01101000	Downlink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1a:** Set according to Table 7.5.1.3.3-3a	LPP Request Capabilities.	
	Step 2: Set according to Table 7.5.1.3.3-4	LPP Provide Assistance Data	
	Step 6: Set according to Table 7.5.1.3.3-8	LPP Request Location Information	
	Step**s 1c and** 7a: Set according to Table 7.5.1.3.3-12	LPP Acknowledgement	
Additional information	Present	Routing Identifier/ Correlation ID	

Table 7.5.1.3.3-3a: LPP Request Capabilities (step 1a, Table 7.5.1.3.2-1)

Derivation Path: Table 5.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-1			

Table 7.5.1.3.3-4: LPP Provide Assistance data (step 2, Table 7.5.1.3.2-1)

Derivation Path: Table 5.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-2 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			
otdoa-ProvideAssistanceData SEQUENCE {			
otdoa-NeighbourCellInfo	Set according to Table 7.5.1.3.3-5.		
}			

Table 7.5.1.3.3-5: OTDOA-NeighbourCellInfoList (step 2, Table 7.5.1.3.2-1)

Derivation Path: 36.355 clause 6.5.1.2			
Information Element	**Value/remark**	**Comment**	**Condition**
OTDOA-NeighbourCellInfoList ::= SEQUENCE (SIZE(2)) OF SEQUENCE {			
SEQUENCE (SIZE(1)) OF SEQUENCE {		Cell 3	
physCellId	3		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 3 in 36.508 [8]		
mnc	As defined for Cell 3 in 36.508 [8]		
cellidentity	As defined for Cell 3 in 36.508 [8]		
}			
earfcn	For E-UTRA band < 65: as defined for Cell 3 in 36.508 [8] For E-UTRA band > 64: not present		
cpLength	Not present	Same as for the reference cell	
prsInfo SEQUENCE {			
prs-Bandwidth	PRS are transmitted over the used system bandwidth (see subclause 5.2.2)		
prs-ConfigurationIndex	12		
numDL-Frames	sf-1		
prs-MutingInfo-r9	Not present	PRS muting is not used.	
prsID-r14	Not present	PRS-ID not used	Rel-14 onwards
add-numDL-Frames-r14	Not present	Not required	Rel-14 onwards
prsOccGroupLen-r14	Not present	No PRS occasion group configured	Rel-14 onwards
prsHoppingInfo-r14	Not present	PRS frequency hopping not used	Rel-14 onwards
}			
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	10		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 µs	
earfcn-v9a0	For E-UTRA band < 65: not present For E-UTRA Band > 64: as defined for Cell 3 in 36.508 [8]		
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Normal		Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
}			

SEQUENCE (SIZE(1)) OF SEQUENCE {		Cell 6	Assumes that earfcn for Cell 6 is different from earfcn for Cell 3.
physCellId	6		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 6 in 36.508 [8]		
mnc	As defined for Cell 6 in 36.508 [8]		
cellidentity	As defined for Cell 6 in 36.508 [8]		
}			
earfcn	For E-UTRA band < 65: as defined for Cell 6 in 36.508 [8] For E-UTRA band > 64: not present		
cpLength	Not present	Same as for the reference cell	
prsInfo SEQUENCE {			
prs-Bandwidth	PRS are transmitted over the used system bandwidth (see subclause 5.2.2)		
prs-ConfigurationIndex	12		
numDL-Frames	sf-1		
prs-MutingInfo-r9	Not present	PRS muting is not used.	
prsID-r14	Not present	PRS-ID not used	Rel-14 onwards
add-numDL-Frames-r14	Not present	Not required	Rel-14 onwards
prsOccGroupLen-r14	Not present	No PRS occasion group configured	Rel-14 onwards
prsHoppingInfo-r14	Not present	PRS frequency hopping not used	Rel-14 onwards
}			
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	10		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 μs	
earfcn-v9a0	For E-UTRA band < 65: not present For E-UTRA band > 64: as defined for Cell 6 in 36.508 [8]		
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Normal		Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards

}			
}			

Table 7.5.1.3.3-6: RRC InterFreqRSTDMeasurementIndication (step 1, Table 7.5.1.3.2-2)

Derivation Path: 36.331, clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
InterFreqRSTDMeasurementIndication-r10 ::= SEQUENCE{			
criticalExtensions CHOICE {			
c1 CHOICE {			
interFreqRSTDMeasurementIndication-r10 SEQUENCE {			
rstd-InterFreqIndication-r10 CHOICE {			
start SEQUENCE {			
rstd-InterFreqInfoList-r10 SEQUENCE {	2 entries		
carrierFreq-r10[1]	For E-UTRA band < 65: as defined for Cell 3 in 36.508 [8] For E-UTRA band > 64: 65535		
measPRS-Offset-r10[1]	(0..39)		
carrierFreq-v1090[1]	For E-UTRA band < 65: not present For E-UTRA band > 64: as defined for Cell 3 in 36.508 [8]		
carrierFreq-r10[2]	For E-UTRA band < 65: as defined for Cell 6 in 36.508 [8] For E-UTRA band > 64: 65535		
measPRS-Offset-r10[2]	(0..39)		
carrierFreq-v1090[2]	For E-UTRA band < 65: Not present For E-UTRA band > 64: as defined for Cell 6 in 36.508 [8]		
}			
}			
}			
lateNonCriticalExtension OCTET STRING	Not present		
nonCriticalExtension SEQUENCE {}	Not present		
}			
criticalExtensionsFuture SEQUENCE {}	Not present		
}			
}			
}			

Table 7.5.1.3.3-7: RRCConnectionReconfiguration (step 2, Table 7.5.1.3.2-2)

Derivation Path: 36.508, Table 4.6.1-8			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in 36.508, Table 4.6.1-8 with the following exceptions:			
measConfig ::= SEQUENCE {			
measGapConfig CHOICE {			
setup SEQUENCE {			
gapOffset CHOICE {			
gp0	Value of measPRS-Offset-r10 as provided by the UE in Table 7.5.1.3.3-6.		
}			
}			
}			

}			

Table 7.5.1.3.3-8: LPP Request Location Information (step 6, Table 7.5.1.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsRequired		
time	10		

Table 7.5.1.3.3-9: ULInformationTransfer (steps 1b and 7, Table 7.5.1.3.2-1)

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
ulInformationTransfer-r8 SEQUENCE {			
dedicatedInfoType CHOICE {			
dedicatedInfoNAS OCTET STRING	Set according to Table 7.5.1.3.3-10	UPLINK GENERIC NAS TRANSPORT	
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

Table 7.5.1.3.3-10: UPLINK GENERIC NAS TRANSPORT (steps 1b and 7, Table 7.5.1.3.2-1)

Derivation Path: 24.301 Table 8.2.32.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Protocol discriminator	0111	EPS mobility management messages	
Security header type	0000	Plain NAS message	
Uplink generic NAS transport message identity	01101001	Uplink generic NAS transport	
Generic message container type	00000001	LTE Positioning Protocol (LPP) message container	
Generic message container	**Step 1b:** Set according to Table 7.5.1.3.3-10a	LPP Provide Capabilities	
	Step 7: Set according to Table 7.5.1.3.3-11	LPP Provide Location Information	
Additional information	present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1a or 6 Table 7.5.1.3.2-1)	

Table 7.5.1.3.3-10a: LPP Provide Capabilities. (step 1b, Table 7.5.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1a, Table 7.5.1.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
otdoa-ProvideCapabilities	Dependent on UE capabilities		
ecid-ProvideCapabilities	Dependent on UE capabilities		
epdu-ProvideCapabilities	Not present		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
wlan-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
bt-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.5.1.3.3-11: LPP Provide Location Information (step 7, Table 7.5.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 6, Table 7.5.1.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	May be present. Any value acceptable		
a-gnss-ProvideLocationInformation	Not present		
otdoa-ProvideLocationInformation	May be present. Any value acceptable		
ecid-ProvideLocationInformation	Not present		
epdu-ProvideLocationInformation	Not present		
sensor-ProvideLocationInformation-r13	Not present	Rel-13 onwards	
tbs-ProvideLocationInformation-r13	Not present	Rel-13 onwards	
wlan-ProvideLocationInformation-r13	Not present	Rel-13 onwards	
bt-ProvideLocationInformation-r13	Not present	Rel-13 onwards	
}			
}			
}			
}			
}			
}			

Table 7.5.1.3.3-12: LPP Acknowledgement (steps 1c and 7a, Table 7.5.1.3.2-1)

Derivation Path: 36.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 1b or 7, Table 7.5.1.3.2-1	
}			
lpp-MessageBody	Not present.		
}			

Table 7.5.1.3.3-13: RRC InterFreqRSTDMeasurementIndication (step 1, Table 7.5.1.3.2-3)

Derivation Path: 36.331, clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
InterFreqRSTDMeasurementIndication-r10 ::= SEQUENCE{			
criticalExtensions CHOICE {			
c1 CHOICE {			
interFreqRSTDMeasurementIndication-r10 SEQUENCE {			
rstd-InterFreqIndication-r10 CHOICE {			
stop	NULL		
}			
lateNonCriticalExtension OCTET STRING	Not present		
nonCriticalExtension SEQUENCE {}	Not present		
}			
criticalExtensionsFuture SEQUENCE {}	Not present		
}			
}			
}			

Table 7.5.1.3.3-14: RRCConnectionReconfiguration (step 2, Table 7.5.1.3.2-3)

Derivation Path: 36.508, Table 4.6.1-8			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in 36.508, Table 4.6.1-8 with the following exceptions:			
measConfig ::= SEQUENCE {			
measGapConfig CHOICE {			
release	NULL		
}			
}			

7.5.2 Void

8 Default Conditions for NR

8.1 LCS Sub-Test Cases

Some test cases defined in clause 9 may include several sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a sub-test case number as defined in Table 8.1-1. The applicable sub-tests for each test case are specified in the test procedure sequence clause of each test case. If no sub-tests are defined for a specific test case it means that this particular test case is not dependent on a specific positioning method and is applicable in all cases, independently of the positioning method(s) supported by the UE.

Table 8.1-1: Sub-Test Case Numbers for NR

Sub-Test Case Number	Supported Positioning Methods
1	Void
2	Void
3	Void
4	Void
5	UE supporting OTDOA (LTE)
6	UE supporting ECID (LTE)
7	UE supporting GNSS(1) and OTDOA (LTE)
8	Void
9	Void
10	Void
11	UE supporting WLAN (Rel-13 only)
12	UE supporting MBS(2) (Rel-13 only)
13	UE supporting Bluetooth
14	UE supporting Sensor (Rel-13 only)
15	UE supporting GNSS(1)
16	UE supporting MBS(2) (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
19	UE supporting Multi-RTT (Rel-16 onwards)
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
22	UE supporting NR E-CID (Rel-16 onwards)
23	UE supporting MBS(2) (Rel-16 onwards)
24	UE supporting Sensor (Rel-16 onwards)
25	UE supporting GNSS(1) (Rel-15 onwards)
26	UE supporting Multi-RTT (Rel-17 onwards)
27	UE supporting DL-AoD (Rel-17 onwards)
28	UE supporting DL-TDOA (Rel-17 onwards)
29	UE supporting UL-TDOA (Rel-17 onwards)
30	UE supporting Multi-RTT (Rel-18 onwards)
31	UE supporting DL-AoD (Rel-18 onwards)
32	UE supporting DL-TDOA (Rel-18 onwards)
NOTE 1: The GNSS combination of BDS, Galileo, GLONASS, GPS supported by the UE NOTE 2: Metropolitan Beacon System (MBS) is a specific type of Terrestrial Beacon System (TBS) [29]	

8.1A Test Configurations

For ease of use of this document a number of Test Configurations corresponding to Network Deployment Types are defined in Table 8.1A-1.

Table 8.1A-1: Test Configuration

Test Configuration	Network Deployment Type
A	EN-DC
B	NG-RAN NR
C	NE-DC
D	NG-RAN E-UTRA
E	NGEN-DC

8.2 Default signal conditions

8.2.1 Simulated GNSS environment

Same as defined in clause 5.2.1.

For Test Configuration B (Table 8.1A-1) the NR Cell 1 frequency to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

For Test Configuration D (Table 8.1A-1) the LTE Cell 1 frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

8.2.2 Simulated OTDOA (LTE) environment

For Test Configuration B (Table 8.1A-1) the NR Cell 1 frequency to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

For Test Configuration B (Table 8.1A-1) an additional independent multi cell LTE environment is used with LTE Cell 1 and LTE Cell 2 (where required) . The E-UTRA frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

For Test Configuration D (Table 8.1A-1), the LTE Cell 1 and LTE Cell 2 (where required) E-UTRA frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

All LTE cells transmit PRS according to the PRS configuration provided in the OTDOA (LTE) assistance data defined in subclause 8.4.1.2. The positioning subframes are low-interference subframes, i.e. contain no PDSCH transmissions.

LTE Cell 1 is the OTDOA reference cell, LTE Cell 2 (where required) is an OTDOA neighbour cell.

Where two LTE cells are required, the two LTE Cells 1 and 2 shall be synchronized, and the timing offset (the RSTD) between the cells, referenced to the UE's antenna input, shall be set equal to the *expectedRSTD* value provided in the OTDOA (LTE) assistance data, as defined in subclause 8.4.1.2.

Normal propagation condition is used for all cells.

8.2.3 Simulated ECID (LTE) environment

Same as defined in clause 5.2.3.

For Test Configuration B (Table 8.1A-1) up to and including LPP Rel-15, UE Rx-Tx measurement is not possible and therefore there is little value in testing ECID (LTE) for positioning purposes and ECID (LTE) shall not be tested.

For Test Configuration D (Table 8.1A-1), the LTE Cell 1 and LTE Cell 2 E-UTRA frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

8.2.4 Simulated MBS environment

Same as defined in clause 5.2.4.

For Test Configuration B (Table 8.1A-1) the NR Cell 1 frequency to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

For Test Configuration D (Table 8.1A-1) the LTE Cell 1 frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

8.2.5 Simulated WLAN environment

Same as defined in clause 5.2.5.

For Test Configuration B (Table 8.1A-1) the NR Cell 1 frequency to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

For Test Configuration D (Table 8.1A-1) the LTE Cell 1 frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

8.2.6 Simulated Bluetooth environment

Same as defined in clause 5.2.6.

For Test Configuration B (Table 8.1A-1) the NR Cell 1 frequency to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

For Test Configuration D (Table 8.1A-1) the LTE Cell 1 frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

8.2.7 Simulated Sensor environment

Same as defined in clause 5.2.7.

For Test Configuration B (Table 8.1A-1) the NR Cell 1 frequency to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

For Test Configuration D (Table 8.1A-1) the LTE Cell 1 frequency to be tested and other default conditions are as specified for signalling test cases in 3GPP TS 36.508 [8].

8.2.8 Simulated general NR environment

For NR FR2, the connection between the SS and the DUT shall be OTA. The SS shall ensure that the NR cell is suitable throughout the test. The OTA link shall be sufficient to provide stable LPP message transmissions between the SS and the DUT.

For NR FR1 and the other technologies used for the test cases in Chapter 9 (e.g. LTE, GNSS, WLAN…) the connection shall be conducted, following the settings described in this section.

8.2.9 Simulated Multi-RTT environment

For Multi-RTT signalling test cases NR Cell 1 is used, as defined in 3GPP TS 38.508-1 [30].

NR cell transmits DL-PRS according to the DL-PRS configuration provided in the Multi-RTT assistance data defined in subclause 8.4.1.6. The UE transmits UL-SRS according to the UL-SRS configuration provided in the RRC message as defined in subclause 8.3.2.

Normal propagation condition is used for all cells.

The simulated general NR environment as specified in 8.2.8 also applies.

Multi-RTT tests are only applicable for Test Configuration B (Table 8.1A-1). The NR Cell 1 frequency to be used for testing and other default conditions is as specified for signalling test cases in 3GPP TS 38.508-1 [30].

8.2.10 Simulated DL-AoD environment

For DL-AoD signalling test cases NR Cell 1 and NR Cell 2 (if required) are used, as defined in 3GPP TS 38.508-1 [30].

All NR cells transmit DL-PRS according to the DL-PRS configuration provided in the DL-AoD assistance data defined in subclause 8.4.1.7.

Normal propagation condition is used for all cells.

The simulated general NR environment as specified in 8.2.8 also applies.

DL-AoD tests are only applicable for Test Configuration B (Table 8.1A-1). The NR Cell 1 and NR Cell 2 frequencies to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

8.2.11 Simulated DL-TDOA environment

For DL-TDOA signalling test cases a multi cell environment with NR Cell 1, NR Cell 2 and NR Cell 3 (if required) are used, as defined in 3GPP TS 38.508-1 [30].

All NR cells transmit DL-PRS according to the DL-PRS configuration provided in the DL-TDOA assistance data defined in subclause 8.4.1.8.

Normal propagation condition is used for all cells.

NR Cell 1 is the DL-TDOA reference cell. NR Cell 2 and NR Cell 3 are DL-TDOA neighbour cells.

The simulated general NR environment as specified in 8.2.8 also applies.

DL-TDOA tests are only applicable for Test Configuration B (Table 8.1A-1). The NR Cell 1, NR Cell 2 and NR Cell 3 frequencies to be used for testing and other default conditions are as specified for signalling test cases in 3GPP TS 38.508-1 [30].

8.2.12 Simulated NR E-CID environment

For NR E-CID signalling test cases NR Cell 1 is used, as defined in 3GPP TS 38.508-1 [30].

8.2.13 Simulated UL-TDOA environment

For UL-TDOA signalling test cases NR Cell 1 is used, as defined in 3GPP TS 38.508-1 [30].

The simulated general NR environment as specified in 8.2.8 also applies.

UL-TDOA test is only applicable for Test Configuration B (Table 8.1A-1). The NR Cell 1 frequency to be used for testing and other default conditions is as specified for signalling test cases in 3GPP TS 38.508-1 [30].

The simulated general NR environment as specified in 8.2.8 also applies.

NR E-CID tests are only applicable for Test Configuration B (Table 8.1A-1). The NR Cell 1 frequency to be used for testing and other default conditions is as specified for signalling test cases in 3GPP TS 38.508-1 [30].

8.3 Default RRC and NAS message and information elements contents

The default values of common RRC and NAS messages and information elements are used as defined in 3GPP TS 38.508-1 [30] with the following exceptions:

Table 8.3-1: Void

Table 8.3-2: Void

- REGISTRATION ACCEPT

Table 8.3-3: REGISTRATION ACCEPT

Derivation Path: 38.508-1 Table 4.7.1-7			
Information Element	**Value/remark**	**Comment**	**Condition**
5GS network feature support	Set according to Table 8.3-4		

Table 8.3-4: 5GS network feature support

Derivation Path: 24.501 clause 9.11.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in 38.508-1 Table 4.7.1-7 with the following exceptions:			
Emergency service support indicator for 3GPP access (EMC) (octet 3, bit 3 and bit 4)	01	Emergency services supported in NR connected to 5GCN only	

8.3.1 RRC message contents for measurement gaps

Table 8.3.1-1: RRCReconfiguration for meas gaps

Derivation Path: TS 38.331 [6], clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier		
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
radioBearerConfig	Not present		
	Not present		
measConfig	MeasConfig	Table 8.3.1-2	
lateNonCriticalExtension	Not present		
nonCriticalExtension	Not present		
}			
}			
}			

Table 8.3.1-2: MeasConfig

Derivation Path: TS 38.331 [6], clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList	MeasObjectToAddModList	Table 8.3.1-4	
reportConfigToRemoveList	Not present		
reportConfigToAddModList	Not present		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
s-MeasureConfig	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig	Table 8.3.1-3	
measGapSharingConfig	Not present		
}			

Table 8.3.1-3: MeasGapConfig

Derivation Path: TS 38.331 [6], clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasGapConfig ::= SEQUENCE {			
gapFR2	Not present		
gapFR1	Not present		
gapUE CHOICE {			
setup SEQUENCE {			
gapOffset	10		
mgl	ms3		
mgrp	ms160		
mgta	ms0		
}			
}			
}			

Table 8.3.1-4: MeasObjectToAddModList

Derivation Path: TS 38.331 [6], clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectToAddModList ::=SEQUENCE (SIZE (1..maxNrofObjectId)) OF MeasObjectToAddMod {	1 entry		
MeasObjectToAddMod[1] SEQUENCE {		entry 1	
measObjectId	1		
measObject CHOICE {			
measObjectNR	MeasObjectNR	Table 8.3.1-5	
}			
}			
}			

Table 8.3.1-5: MeasObjectNR

Derivation Path: TS 38.331 [6], clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectNR ::=SEQUENCE {			
ssbFrequency	ARFCN-ValueNR for NR Cell 1		
ssbSubcarrierSpacing	Subcarrier spacing of SSB for NR Cell 1		
smtc1	Not present		
smtc2	Not present		
refFreqCSI-RS	Not present		
referenceSignalConfig SEQUENCE {			
ssb-ConfigMobility	Not present		
csi-rs-ResourceConfigMobility	Not present		
}			
absThreshSS-BlocksConsolidation	Not present		
absThreshCSI-RS-Consolidation	Not present		
nrofSS-BlocksToAverage	Not present		
nrofCSI-RS-ResourcesToAverage	Not present		
quantityConfigIndex	1		
offsetMO SEQUENCE {			
rsrpOffsetSSB	dB0		
rsrqOffsetSSB	dB0		
sinrOffsetSSB	dB0		
rsrpOffsetCSI-RS	dB0		
rsrqOffsetCSI-RS	dB0		
sinrOffsetCSI-RS	dB0		
}			
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
excludedCellsToRemoveList	Not present		
excludedCellsToAddModList	Not present		
allowedCellsToRemoveList	Not present		
allowedCellsToAddModList	Not present		
freqBandIndicatorNR	Not present		
measCycleSCell	Not present		
smtc3list-r16	Not present		
rmtc-Config-r16	Not present		
t312-r16	Not present		
associatedMeasGapSSB-r17	Not present		
associatedMeasGapCSIRS-r17	Not present		
smtc4list-r17	Not present		
measCyclePSCell-r17	Not present		
cellsToAddModListExt-v1710	Not present		
associatedMeasGapSSB2-v1720	Not present		
associatedMeasGapCSIRS2-v1720	Not present		
}			

8.3.2 RRC message contents for UL-SRS Configuration

Table 8.3.2-1: RRCReconfiguration

Derivation Path: TS 38.508-1, table 4.6.1-3			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
radioBearerConfig			
nonCriticalExtension SEQUENCE {			
masterCellGroup	CellGroupConfig		
}			
}			
}			

Table 8.3.2-2: CellGroupConfig

Derivation Path: 38.508-1 [30], Table 4.6.3-19			
Information Element	**Value/remark**	**Comment**	**Condition**
CellGroupConfig ::= SEQUENCE {			
spCellConfig SEQUENCE {			
spCellConfigDedicated SEQUENCE {			
uplinkConfig SEQUENCE {			
initialUplinkBWP SEQUENCE {			
srs-Config CHOICE {			
setup	srs-Config		
}			
}			
}			
}			
}			

Table 8.3.2-3: SRS-Config

Derivation Path: TS 38.331, clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SRS-Config ::= SEQUENCE {			
srs-PosResourceSetToReleaseList-r16	Not present		
srs-PosResourceSetToAddModList-r16 SEQUENCE (SIZE(1..maxNrofSRS-PosResourceSets-r16)) OF SRS-PosResourceSet-r16 {	1 entry		
SRS-PosResourceSet-r16[1] SEQUENCE {		entry 1	
srs-PosResourceSetId-r16	0		
srs-PosResourceIdList-r16 SEQUENCE (SIZE(1..maxNrofSRS-ResourcesPerSet)) OF SRS-PosResourceId-r16 {	1 entry		
SRS-PosResourceId-r16[1]	0	entry 1	
}			
resourceType-r16 CHOICE {			
periodic-r16 SEQUENCE {			
}			
alpha-r16	Not present		
p0-r16	-100		
pathlossReferenceRS-Pos-r16 CHOICE {			
ssb-IndexServing-r16	1	Set according to Table 4.4.2-2 in TS 38.508-1.	
}			
}			
srs-PosResourceToReleaseList-r16	Not present		
srs-PosResourceToAddModList-r16 SEQUENCE (SIZE(1..maxNrofSRS-PosResources-r16)) OF SRS-PosResource-r16 {	1 entry		
SRS-PosResource-r16[1]	SRS-PosResource-r16	entry 1	
}			
}			

Table 8.3.2-4: SRS-PosResource-r16

Derivation Path: TS 38.331, clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SRS-PosResource-r16::=SEQUENCE {			
srs-PosResourceId-r16	0		
transmissionComb-r16 CHOICE {			
n4-r16 SEQUENCE {			
combOffset-n4-r16	0		
cyclicShift-n4-r16	0		
}			
}			
resourceMapping-r16 SEQUENCE {			
startPosition-r16	1		
nrofSymbols-r16	n2		
}			
freqDomainShift-r16	0		
freqHopping-r16 SEQUENCE {			
c-SRS-r16	0		
}			
groupOrSequenceHopping-r16	neither		
resourceType-r16 CHOICE {			
periodic-r16 SEQUENCE {			
periodicityAndOffset-p-r16 CHOICE {			
sl160	20		FR1
	23		FR1 AND (HD_FDD OR TDD) AND SCS15Khz
	27		FR1 AND TDD AND SCS30Khz
sl1280	163		FR2
}			
}			
}			
sequenceId-r16	0		
spatialRelationInfoPos-r16 CHOICE {			
servingRS-r16 SEQUENCE {			
servingCellId	0		
referenceSignal-r16 CHOICE {			
ssb-IndexServing-r16	1	Set according to Table 4.4.2-2 in TS 38.508-1.	
}			
}			
}			
}			

Condition	**Explanation**
HD_FDD	pc_halfDuplexFDD_TypeA_RedCap_r17 (i.e HD_FDD UE are performing test on FDD band)

8.4 Default LPP message and information elements contents

The default values of LPP messages and information elements used, unless indicated otherwise in specific clauses of this specification are as defined in clause 5.4 with the following exceptions:

- LPP PROVIDE ASSISTANCE DATA

Table 8.4-1: ProvideAssistanceData

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {	Dependent on test case.		
initiator			
transactionNumber			
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
commonIEsProvideAssistanceData	Not present		
a-gnss-ProvideAssistanceData SEQUENCE {			Sub-tests 7 and 15 only; and as defined in Table 5.4.1.1-1.
gnss-CommonAssistData SEQUENCE {			
gnss-ReferenceTime	As defined in 37.571-5 [12]		
gnss-ReferenceLocation	As defined in 37.571-5 [12]		
gnss-IonosphericModel	As defined in 37.571-5 [12]		
gnss-EarthOrientationParameters	Not present		
gnss-RTK-ReferenceStationInfo-r15	Not present	Rel-15 onwards	
gnss-RTK-CommonObservationInfo-r15	Not present	Rel-15 onwards	
gnss-RTK-AuxiliaryStationData-r15	Not present	Rel-15 onwards	
gnss-SSR-CorrectionPoints-r16	Not present	Rel-16 onwards	
gnss-Integrity-ServiceParameters-r17	Not present	Rel-17 onwards	
gnss-Integrity-ServiceAlert-r17	Not present	Rel-17 onwards	
}			
gnss-GenericAssistData(SIZE(1..4))OF{	SIZE is dependent on the number of GNSSs supported by the UE. If one GNSS supported by the UE, SIZE = 1 If two GNSSs supported by the UE, SIZE = 2 If three GNSSs supported by the UE, SIZE = 3 If four GNSSs supported by the UE, SIZE = 4		
gnss-ID	For each GNSS supported by the UE.		
sbas-ID	Not present		
gnss-TimeModels	As defined in 37.571-5 [12]		
gnss-DifferentialCorrections	Not present		
gnss-NavigationModel	As defined in 37.571-5 [12]		
gnss-RealTimeIntegrity	Not present		
gnss-DataBitAssistance	Not present		
gnss-AcquisitionAssistance	As defined in 37.571-5 [12]		
gnss-Almanac	As defined in 37.571-5 [12]		
gnss-UTC-Model	As defined in 37.571-5 [12]		

gnss-AuxiliaryInformation	As defined in 37.571-5 [12]		
bds-DifferentialCorrections-r12	Not present	Rel-12 onwards	
bds-GridModel-r12	Not present	Rel-12 onwards	
gnss-RTK-Observations-r15	Not present	Rel-15 onwards	
glo-RTK-BiasInformation-r15	Not present	Rel-15 onwards	
gnss-RTK-MAC-CorrectionDifferences-r15	Not present	Rel-15 onwards	
gnss-RTK-Residuals-r15	Not present	Rel-15 onwards	
gnss-RTK-FKP-Gradients-r15	Not present	Rel-15 onwards	
gnss-SSR-OrbitCorrections-r15	Not present	Rel-15 onwards	
gnss-SSR-ClockCorrections-r15	Not present	Rel-15 onwards	
gnss-SSR-CodeBias-r15	Not present	Rel-15 onwards	
gnss-SSR-URA-r16	Not present	Rel-16 onwards	
gnss-SSR-PhaseBias-r16	Not present	Rel-16 onwards	
gnss-SSR-STEC-Correction-r16	Not present	Rel-16 onwards	
gnss-SSR-GriddedCorrection-r16	Not present	Rel-16 onwards	
navic-DifferentialCorrections-r16	Not present	Rel-16 onwards	
navic-GridModel-r16	Not present	Rel-16 onwards	
}			
gnss-Error	Not present		
}			
otdoa-ProvideAssistanceData SEQUENCE {			Sub-tests 5 and 7 only
otdoa-ReferenceCellInfo	As defined in Table 8.4.1.2-1		
otdoa-NeighbourCellInfo	As defined in Table 8.4.1.2-2		
otdoa-Error	Not present		
otdoa-ReferenceCellInfoNB-r14	Not present	Rel-14 onwards	
otdoa-NeighbourCellInfoNB-r14	Not present	Rel-14 onwards	
}			
epdu-Provide-AssistanceData	Not present		
sensor-ProvideAssistanceData-r14 SEQUENCE {		Rel-14 onwards	Sub-test 18 only as defined in clause 5.4.1.5
sensor-AssistanceDataList-r14	As defined in Table 5.4.1.5-2		
sensor-Error-r14	Not present		
}			
tbs-ProvideAssistanceData-r14 SEQUENCE {		Rel-14 onwards	Sub-test 16 only as defined in clause5.4.1.3
tbs-AssistanceDataList-r14 SEQUENCE {			
mbs-AssistanceDataList-r14 SEQUENCE (SIZE(1..n)) OF SEQUENCE{			
mbs-AlmanacAssistance-r14	As defined in Table 5.4.1.3-2		
mbs-AcquisitonAssistance-r14	As defined in Table 5.4.1.3-2		
}			
}			
tbs-Error-r14	Not present		
}			
wlan-ProvideAssistanceData-r14 SEQUENCE {		Rel-14 onwards	Sub-test 17 only as defined in clause 5.4.1.4
wlan-DataSet-r14	As defined in Table 5.4.1.4-2		
wlan-Error-r14	Not present		
}			

nr-Multi-RTT-ProvideAssistanceData-r16 SEQUENCE {		Rel-16 onwards	Sub-test 19, Sub-test 26 and Sub-test 30
nr-DL-PRS-AssistanceData-r16	As defined in Table 8.4.1.6-1		
nr-SelectedDL-PRS-IndexList-r16	As defined in Table 8.4.1.6-2		
nr-Multi-RTT-Error-r16	Not present		
nr-On-Demand-DL-PRS-Configurations-r17	Not present	Rel-17 onwards	
nr-On-Demand-DL-PRS-Configurations-Selected-IndexList-r17	Not present	Rel-17 onwards	
assistanceDataValidityArea-r17	Not present	Rel-17 onwards	
}			
nr-DL-AoD-ProvideAssistanceData-r16 SEQUENCE {		Rel-16 onwards	Sub-test 20, Sub-test 27 and Sub-test 31
nr-DL-PRS-AssistanceData-r16	As defined in Table 8.4.1.6-1		
nr-SelectedDL-PRS-IndexList-r16	As defined in Table 8.4.1.6-2		
nr-PositionCalculationAssistance-r16	Present or not present dependent on pc_UEB_DL_AoD. As defined in Table 8.4.1.7-1		
nr-DL-AoD-Error-r16	Not present		
nr-DL-PRS-BeamInfo-r17	Not present	Rel-17 onwards	
nr-On-Demand-DL-PRS-Configurations-r17	Not present	Rel-17 onwards	
nr-On-Demand-DL-PRS-Configurations-Selected-IndexList-r17	Not present	Rel-17 onwards	
assistanceDataValidityArea-r17	Not present	Rel-17 onwards	
}			
nr-DL-TDOA-ProvideAssistanceData-r16 SEQUENCE {		Rel-16 onwards	Sub-test 21, Sub-test 28 and Sub-test 32
nr-DL-PRS-AssistanceData-r16	As defined in Table 8.4.1.6-1		
nr-SelectedDL-PRS-IndexList-r16	As defined in Table 8.4.1.6-2		
nr-PositionCalculationAssistance-r16	Present or not present dependent on pc_UEB_DL_TDOA. As defined in Table 8.4.1.7-1		
nr-DL-TDOA-Error-r16	Not present		
nr-On-Demand-DL-PRS-Configurations-r17	Not present	Rel-17 onwards	
nr-On-Demand-DL-PRS-Configurations-Selected-IndexList-r17	Not present	Rel-17 onwards	
assistanceDataValidityArea-r17	Not present	Rel-17 onwards	
}			
}			
}			
}			
}			
}			
}			

- LPP REQUEST CAPABILITIES

Table 8.4-2: RequestCapabilities

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
Initiator	locationServer		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestCapabilities-r9 SEQUENCE {			
commonIEsRequestCapabilities SEQUENCE {	Present	Rel-14 onwards	
lpp-message-segmentation-req-r14	00	Server is not able to send segmented LPP messages. Server is not able to receive segmented LPP messages. Rel-14 onwards	
}			
a-gnss-RequestCapabilities SEQUENCE {			
gnss-SupportListReq	TRUE		
assistanceDataSupportListReq	TRUE		
locationVelocityTypesReq	TRUE		
}			
otdoa-RequestCapabilities SEQUENCE {	Present		
}			
ecid-RequestCapabilities SEQUENCE {	Present		
}			
epdu-RequestCapabilities	Not present		
sensor-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
tbs-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
wlan-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
bt-RequestCapabilities-r13 SEQUENCE {	Present	Rel-13 onwards	
}			
nr-ECID-RequestCapabilities-r16 SEQUENCE {	Present	Rel-16 onwards	
}			
nr-Multi-RTT-RequestCapabilities-r16 SEQUENCE {	Present	Rel-16 onwards	
}			
nr-DL-AoD-RequestCapabilities-r16 SEQUENCE {	Present	Rel-16 onwards	
}			
nr-DL-TDOA-RequestCapabilities-r16 SEQUENCE {	Present	Rel-16 onwards	
}			
nr-UL-RequestCapabilities-r16 SEQUENCE {	Present	Rel-16 onwards	
}			
}			
}			
}			
}			
}			
}			

- LPP REQUEST LOCATION INFORMATION

Table 8.4-3: RequestLocationInformation

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	Not present		
acknowledgement	Not present		
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestLocationInformation-r9 SEQUENCE {			
commonIEsRequestLocationInformation SEQUENCE {			
locationInformationType	Dependent on test case		
triggeredReporting	Not present		
periodicalReporting	Not present		
additionalInformation	onlyReturnInformationRequested		
qos SEQUENCE {			
horizontalAccuracy	Not present		
verticalCoordinateRequest	FALSE		
verticalAccuracy	Not present		
responseTime SEQUENCE {			
time	32		
responseTimeEarlyFix-r12	Not present	Rel-12 onwards	
}			
velocityRequest	FALSE		
messageSizeLimitNB-r14	Not present	Rel-14 onwards	
segmentationInfo-r14	Not present	Rel-14 onwards	
scheduledLocationTime-r17	Not present	Rel-17 onwards	
targetIntegrityRisk-r17	Not present	Rel-17 onwards	
}			
environment	Not present		
locationCoordinateTypes	Not present		
velocityTypes	Not present		
}			
a-gnss-RequestLocationInformation	As defined in Table 5.4-4		Sub-tests 7 and 15
otdoa-RequestLocationInformation	As defined in Table 5.4-5		Sub-test 5 and 7
ecid-RequestLocationInformation	As defined in Table 5.4-6		Sub-test 6
epdu-RequestLocationInformation	Not Present		
sensor-RequestLocationInformation-r13	As defined in Table 5.4-10	Rel-13 onwards	Sub-test 14, 18
tbs-RequestLocationInformation-r13	As defined in Table 5.4-7	Rel-13 onwards	Sub-tests 12, 16
wlan-RequestLocationInformation-r13	As defined in Table 5.4-8	Rel-13 onwards	Sub-test 11, 17
bt-RequestLocationInformation-r13	As defined in Table 5.4-9	Rel-13 onwards	Sub-test 13
nr-ECID-RequestLocationInformation-r16	As defined in Table 8.4-4	Rel-16 onwards	Sub-test 22
nr-Multi-RTT-RequestLocationInformation-r16	As defined in Table 8.4-5	Rel-16 onwards	Sub-test 19, Sub-test 26 and Sub-test 30
nr-DL-AoD-RequestLocationInformation-r16	As defined in Table 8.4-6	Rel-16 onwards	Sub-test 20, Sub-test 27 and Sub-test 31

nr-DL-TDOA-RequestLocationInformation-r16	As defined in Table 8.4-7	Rel-16 onwards	Sub-test 21, Sub-test 28 and Sub-test 32
}			
}			
}			
}			
}			
}			

- NR E-CID REQUEST LOCATION INFORMATION

Table 8.4-4: NR-ECID-RequestLocationInformation

Derivation Path: 37.355 clause 6.5.9.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-ECID-RequestLocationInformation-r16 ::= SEQUENCE {			
requestedMeasurements-r16	All measurements supported by the UE		
}			

- NR Multi-RTT REQUEST LOCATION INFORMATION

Table 8.4-5: NR-Multi-RTT-RequestLocationInformation

Derivation Path: 37.355 clause 6.5.12.5			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-Multi-RTT-RequestLocationInformation-r16 ::= SEQUENCE {			
nr-UE-RxTxTimeDiffMeasurementInfoRequest-r16	Not present		
nr-RequestedMeasurements-r16	bit 0 = 1 (prsrsrpReq)		
nr-AssistanceAvailability-r16	FALSE		
nr-Multi-RTT-ReportConfig-r16 SEQUENCE {			
maxDL-PRS-RxTxTimeDiffMeasPerTRP-r16	Not present		
timingReportingGranularityFactor-r16	Not present		
}			
additionalPaths-r16	Not present		
nr-UE-RxTxTEG-Request-r17	Not present	Rel-17 onwards	
measureSameDL-PRS-ResourceWithDifferentRxTxTEGs-r17	Not present	Rel-17 onwards	
measureSameDL-PRS-ResourceWithDifferentRxTEGs-r17	Not present	Rel-17 onwards	
reducedDL-PRS-ProcessingSamples-r17	Not present	Rel-17 onwards	
nr-los-nlos-IndicatorRequest-r17	Not present	Rel-17 onwards	
additionalPathsExt-r17	Not present	Rel-17 onwards	
additionalPathsDL-PRS-RSRP-Request-r17	Not present	Rel-17 onwards	
multiMeasInSameReport-r17	Not present	Rel-17 onwards	
lowerRxBeamSweepingFactor-FR2-r17	Not present	Rel-17 onwards	
nr-DL-PRS-RxHoppingRequest-r18	Not present	Rel-18 onwards	
timingReportingGranularityFactorExt-r18	Not present	Rel-18 onwards	
nr-DL-PRS-JointMeasurementRequest-r18	Not present	Rel-18 onwards	
nr-DL-PRS-MeasurementTimeWindowsConfig-r18	Not present	Rel-18 onwards	
nr-NTN-UE-RxTxMeasurementsRequest-r18	Not present	Rel-18 onwards	
}			

- NR DL-AoD REQUEST LOCATION INFORMATION

Table 8.4-6: NR-DL-AoD-RequestLocationInformation

Derivation Path: 37.355 clause 6.5.11.5			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-AoD-RequestLocationInformation-r16 ::= SEQUENCE {			
nr-AssistanceAvailability-r16	FALSE		
nr-DL-AoD-ReportConfig-r16 SEQUENCE {			
maxDL-PRS-RSRP-MeasurementsPerTRP-r16	Not present		
maxDL-PRS-RSRP-MeasurementsPerTRP-r17	Not present	Rel-17 onwards	
maxDL-PRS-RSRPP-MeasurementsPerTRP-r17	Not present	Rel-17 onwards	
nr-los-nlos-IndicatorRequest-r17	Not present	Rel-17 onwards	
reducedDL-PRS-ProcessingSamples-r17	Not present	Rel-17 onwards	
lowerRxBeamSweepingFactor-FR2-r17	Not present	Rel-17 onwards	
}			
multiMeasInSameReport-r17	Not present	Rel-17 onwards	
nr-DL-PRS-RxHoppingRequest-r18	Not present	Rel-18 onwards	
nr-DL-PRS-RxHoppingRequest-r18	Not present	Rel-18 onwards	
}			

- NR DL-TDOA REQUEST LOCATION INFORMATION

Table 8.4-7: NR-DL-TDOA-RequestLocationInformation

Derivation Path: 37.355 clause 6.5.10.5			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-TDOA-RequestLocationInformation-r16 ::= SEQUENCE {			
nr-DL-PRS-RstdMeasurementInfoRequest-r16	Not present		
nr-RequestedMeasurements-r16	bit 0 = 1 (prsrsrpReq)		
nr-AssistanceAvailability-r16	FALSE		
nr-DL-TDOA-ReportConfig-r16 SEQUENCE {			
maxDL-PRS-RSTD-MeasurementsPerTRPPair-r16	Not present		
timingReportingGranularityFactor-r16	Not present		
measureSameDL-PRS-ResourceWithDifferentRxTEGs-r17	Not present	Rel-17 onwards	
reducedDL-PRS-ProcessingSamples-r17	Not present	Rel-17 onwards	
lowerRxBeamSweepingFactor-FR2-r17	Not present	Rel-17 onwards	
}			
additionalPaths-r16	Not present		
nr-UE-RxTEG-Request-r17	Not present	Rel-17 onwards	
nr-los-nlos-IndicatorRequest-r17	Not present	Rel-17 onwards	
additionalPathsExt-r17	Not present	Rel-17 onwards	
additionalPathsDL-PRS-RSRP-Request-r17	Not present	Rel-17 onwards	
multiMeasInSameReport-r17	Not present	Rel-17 onwards	
nr-DL-PRS-JointMeasurementRequest-r18	Not present	Rel-18 onwards	
nr-DL-PRS-RxHoppingRequest-r18	Not present	Rel-18 onwards	
}			

8.4.1 Default assistance data information elements

8.4.1.1 GNSS Assistance Data Elements

The GNSS assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message are as defined in clause 5.4.1.1.

8.4.1.2 OTDOA (LTE) Assistance Data Elements

This clause defines the OTDOA (LTE) assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages.

- OTDOA (LTE) REFERENCE CELL INFO

Table 8.4.1.2-1: OTDOA-ReferenceCellInfo

Derivation Path: 37.355 clause 6.5.1.2			
Information Element	**Value/remark**	**Comment**	**Condition**
OTDOA-ReferenceCellInfo ::= SEQUENCE {		LTE Cell 1	
physCellId	0		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 1 in 36.508 [8]		
mnc	As defined for Cell 1 in 36.508 [8]		
cellidentity	As defined for E-UTRAN Cell Identifier for Cell 1 in 36.508 [8]		
}			
earfcnRef	As defined for Cell 1 in 36.508 [8]		
antennaPortConfig	As defined for Cell 1 in 36.508 [8]		
cpLength	Normal		
prsInfo SEQUENCE {			
prs-Bandwidth	PRS are transmitted over the used system bandwidth (see clause 5.2.2)		
prs-ConfigurationIndex	FDD: 2 TDD: 4		
numDL-Frames	sf-1		
prs-MutingInfo-r9	Not present	PRS muting is not used.	
prsID-r14	Not present	PRS-ID not used	Rel-14 onwards
add-numDL-Frames-r14	Not present	Not required	Rel-14 onwards
prsOccGroupLen-r14	Not present	No PRS occasion group configured	Rel-14 onwards
prsHoppingInfo-r14	Not present	PRS frequency hopping not used	Rel-14 onwards
}			
earfcnRef-v9a0	As defined for Cell 1 in 36.508 [8]		
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
cpLengthCRS-r14	Normal		Rel-14 onwards
sameMBSFNconfigRef-r14	FALSE	Not the same as the serving cell	Rel-14 onwards
dlBandwidth-r14	Not present	PRS frequency hopping not used	Rel-14 onwards
addPRSconfigRef-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
nr-LTE-SFN-Offset-r15	Not present		Rel-15 onwards
tdd-config-v1520	Not present		Rel-15 onwards
nr-LTE-fineTiming-Offset-r15	Not present		Rel-15 onwards
}			

- OTDOA (LTE) NEIGHBOUR CELL INFO LIST

Table 8.4.1.2-2: OTDOA-NeighbourCellInfoList

Derivation Path: 37.355 clause 6.5.1.2			
Information Element	**Value/remark**	**Comment**	**Condition**
OTDOA-NeighbourCellInfoList ::= SEQUENCE (SIZE(1)) OF SEQUENCE {			
SEQUENCE (SIZE(2)) OF SEQUENCE {		Cell 2	
physCellId	2		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 2 in 36.508 [8]		
mnc	As defined for Cell 2 in 36.508 [8]		
cellidentity	As defined for E-UTRAN Cell Identifier for Cell 2 in 36.508 [8]		
}			
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	Not present		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 μs	
earfcn-v9a0	Not present	Same as for the reference cell	
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Not present	Not required	Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
tdd-config-v1520	Not present		Rel-15 onwards
}			
SEQUENCE {		Cell 4	
physCellId	4		
cellGlobalId SEQUENCE {			
mcc	As defined for Cell 4 in 36.508 [8]		
mnc	As defined for Cell 4 in 36.508 [8]		
cellidentity	As defined for E-UTRAN Cell Identifier for Cell 4 in 36.508 [8]		
}			
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	

antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Slot timing is the same as for reference cell	
prs-SubframeOffset	Not present		
expectedRSTD	8192	Value 0	
expectedRSTD-Uncertainty	10	About 1 μs	
earfcn-v9a0	Not present	Same as for the reference cell	
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Not present	Not required	Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
tdd-config-v1520	Not present		Rel-15 onwards
}			
}			

8.4.1.3 MBS Assistance Data Elements

The MBS assistance data elements which shall be provided to the UE in sub-test 16 via LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message are as defined in clause 5.4.1.3.

8.4.1.4 WLAN Assistance Data Elements

The WLAN assistance data elements which shall be provided to the UE in sub-test 17 via LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message are as defined in clause 5.4.1.4.

8.4.1.5 Sensor Assistance Data Elements

The Sensor assistance data elements which shall be provided to the UE in sub-test 18 via LPP Provide Assistance Data messages in the absence of a corresponding LPP Request Assistance Data message are as defined in clause 5.4.1.5.

8.4.1.6 Multi-RTT Assistance Data Elements

This clause defines the Multi-RTT assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages.

- NR DL-PRS ASSISTANCE DATA

Table 8.4.1.6-1: NR-DL-PRS-AssistanceData

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-PRS-AssistanceData-r16 ::= SEQUENCE {			
nr-DL-PRS-ReferenceInfo-r16 SEQUENCE {			
dl-PRS-ID-r16	0		
nr-DL-PRS-ResourceID-List-r16	Not present		
nr-DL-PRS-ResourceSetID-r16	Not present		
}			
nr-DL-PRS-AssistanceDataList-r16 SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF NR-DL-PRS-AssistanceDataPerFreq-r16 {	2 entries		
NR-DL-PRS-AssistanceDataPerFreq-r16[1] SEQUENCE {		entry 1	
nr-DL-PRS-PositioningFrequencyLayer-r16 SEQUENCE {			
dl-PRS-SubcarrierSpacing-r16	SubcarrierSpacing	38.508-1 [30] Table 4.6.3-188	
dl-PRS-ResourceBandwidth-r16	1	24 PRBs	
dl-PRS-StartPRB-r16	same value as 'offsetToCarrier' as defined for the DL frequency of NR Cell 1		
dl-PRS-PointA-r16	absoluteFrequencyPointA as defined for the DL frequency of the NR Cell 1		
dl-PRS-CombSizeN-r16	n2		
dl-PRS-CyclicPrefix-r16	normal		
}			
nr-DL-PRS-AssistanceDataPerFreq-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF NR-DL-PRS-AssistanceDataPerTRP-r16{	2 entries		
NR-DL-PRS-AssistanceDataPerTRP-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	0		
nr-PhysCellID-r16	As defined in TS 38.508-1 table 4.4.2-2, Physical layer cell Identity for SIG for NR Cell 1		
nr-CellGlobalID-r16 SEQUENCE {			
mcc-r15	As defined TS 38.508-1 table 4.4.2-3 for NR Cell 1		
mnc-r15	As defined TS 38.508-1 table 4.4.2-3 for NR Cell 1		
nr-cellidentity-r15	Set to NR Cell 1 Identifier defined in TS 38.508-1 Table 4.4.2-2		
}			
nr-ARFCN-r16	ARFCN-ValueNR for NR Cell 1 frequency		
nr-DL-PRS-SFN0-Offset-r16 SEQUENCE {			
sfn-Offset-r16	0		
integerSubframeOffset-r16	0		
}			
nr-DL-PRS-ExpectedRSTD-r16	0		
nr-DL-PRS-ExpectedRSTD-Uncertainty-r16	4	About 1 μs	
nr-DL-PRS-Info-r16	NR-DL-PRS-Info-r16 as specified in Table 8.4.1.6-3		
prs-OnlyTP-r16	Not present		
nr-DL-PRS-ExpectedAoD-or-AoA-r17	Not present	Rel-17 onwards	
}			

NR-DL-PRS-AssistanceDataPerTRP-r16[2] SEQUENCE {		entry 2	In case of sub-test 20/27/31 UE-based DL-AoD or sub-test 21/28/32 DL-TDOA method supported by the UE as defined in clause 8.2.10 and clause 8.2.11.
dl-PRS-ID-r16	1		
nr-PhysCellID-r16	As defined in TS 38.508-1 table 4.4.2-2, Physical layer cell Identity for SIG for NR Cell 2		
nr-CellGlobalID-r16 SEQUENCE {			
mcc-r15	As defined TS 38.508-1 table 4.4.2-3 for NR Cell 2		
mnc-r15	As defined TS 38.508-1 table 4.4.2-3 for NR Cell 2		
nr-cellidentity-r15	Set to NR Cell 2 Identifier defined in TS 38.508-1 Table 4.4.2-2		
}			
nr-ARFCN-r16	ARFCN-ValueNR for NR Cell 2		
nr-DL-PRS-SFN0-Offset-r16 SEQUENCE {			
sfn-Offset-r16	0		
integerSubframeOffset-r16	0		
}			
nr-DL-PRS-ExpectedRSTD-r16	0		
nr-DL-PRS-ExpectedRSTD-Uncertainty-r16	4	About 1 μs	
nr-DL-PRS-Info-r16	NR-DL-PRS-Info-r16 as specified in Table 8.4.1.6-3		
prs-OnlyTP-r16	Not present		
nr-DL-PRS-ExpectedAoD-or-AoA-r17	Not present	Rel-17 onwards	
}			
}			
}			
NR-DL-PRS-AssistanceDataPerFreq-r16[2] SEQUENCE {		entry 2	In case of sub-test 21/28/32 UE-based DL-TDOA method supported by the UE as defined in clause 8.2.11
nr-DL-PRS-PositioningFrequencyLayer-r16 SEQUENCE {			
dl-PRS-SubcarrierSpacing-r16	SubcarrierSpacing	38.508-1 [30] Table 4.6.3-188	
dl-PRS-ResourceBandwidth-r16	1	24 PRBs	
dl-PRS-StartPRB-r16	same value as 'offsetToCarrier' as defined for the DL frequency of NR Cell 3		

dl-PRS-PointA-r16	absoluteFrequencyPointA as defined for the DL frequency of the NR Cell 3		
dl-PRS-CombSizeN-r16	n2		
dl-PRS-CyclicPrefix-r16	normal		
}			
nr-DL-PRS-AssistanceDataPerFreq-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF NR-DL-PRS-AssistanceDataPerTRP-r16{	1 entry		
NR-DL-PRS-AssistanceDataPerTRP-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	2		
nr-PhysCellID-r16	As defined in TS 38.508-1 table 4.4.2-2, Physical layer cell Identity for SIG for NR Cell 3		
nr-CellGlobalID-r16 SEQUENCE {			
mcc-r15	As defined in TS 38.508-1 [30] Table 4.4.2-3 for NR Cell 3		
mnc-r15	As defined in TS 38.508-1 [30] Table 4.4.2-3 for NR Cell 3		
nr-cellidentity-r15	Set to NR Cell 3 Identifier defined in TS 38.508-1 [30] Table 4.4.2-2		
}			
nr-ARFCN-r16	ARFCN-ValueNR for NR Cell 3 frequency		
nr-DL-PRS-SFN0-Offset-r16 SEQUENCE {			
sfn-Offset-r16	0		
integerSubframeOffset-r16	0		
}			
nr-DL-PRS-ExpectedRSTD-r16	0		
nr-DL-PRS-ExpectedRSTD-Uncertainty-r16	4	About 1 μs	
nr-DL-PRS-Info-r16	NR-DL-PRS-Info-r16 as specified in Table 8.4.1.6-3		
prs-OnlyTP-r16	Not present		
nr-DL-PRS-ExpectedAoD-or-AoA-r17	Not present	Rel-17 onwards	
}			
}			
}			
}			
nr-SSB-Config-r16 SEQUENCE (SIZE (1..nrMaxTRPs-r16)) OF NR-SSB-Config-r16 {	1 entry		In case of sub-test 21/28/32 UE-based DL-TDOA method supported by the UE as defined in clause 8.2.11
NR-SSB-Config-r16[1] SEQUENCE {		entry 1	
nr-PhysCellID-r16	As defined in TS 38.508-1 table 4.4.2-2, Physical layer cell Identity for SIG for NR Cell 3		
nr-ARFCN-r16	ARFCN-ValueNR for NR Cell 3 frequency	As defined in 38.508 -1 [30] subclause 6.2.3.	
ss-PBCH-BlockPower-r16	0		
halfFrameIndex-r16	0		
ssb-periodicity-r16	ms20		
ssb-PositionsInBurst-r16	Not present		

ssb-SubcarrierSpacing-r16	Subcarrier spacing of SSB for NR Cell 3		
sfn-SSB-Offset-r16	0		
}			
}			
}			

- NR-SelectedDL-PRS-IndexList

Table 8.4.1.6-2: NR-SelectedDL-PRS-IndexList

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-SelectedDL-PRS-IndexList-r16 ::= SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF NR-SelectedDL-PRS-PerFreq-r16 {	2 entries		
NR-SelectedDL-PRS-PerFreq-r16[1] SEQUENCE {		entry 1	
nr-SelectedDL-PRS-FrequencyLayerIndex-r16	0		
nr-SelectedDL-PRS-IndexListPerFreq-r16	Not present		
}			
NR-SelectedDL-PRS-PerFreq-r16[2] SEQUENCE {		entry 2	Sub-test 21/28/32 UE-Based only as defined in clause 8.2.11
nr-SelectedDL-PRS-FrequencyLayerIndex-r16	1		
nr-SelectedDL-PRS-IndexListPerFreq-r16	Not present		
}			
}			

- NR-DL-PRS-Info

Table 8.4.1.6-3: NR-DL-PRS-Info

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-PRS-Info-r16 ::= SEQUENCE {			
nr-DL-PRS-ResourceSetList-r16 SEQUENCE (SIZE (1..nrMaxSetsPerTrp-r16)) OF NR-DL-PRS-ResourceSet-r16 {	1 entry		
NR-DL-PRS-ResourceSet-r16[1] SEQUENCE {		entry 1	
nr-DL-PRS-ResourceSetID-r16	0		
dl-PRS-Periodicity-and-ResourceSetSlotOffset-r16	The periodicity is 160ms and the resource set slot offset is 11 ms for any SCS configuration		
dl-PRS-ResourceRepetitionFactor-r16	Not present		
dl-PRS-ResourceTimeGap-r16	Not present		
dl-PRS-NumSymbols-r16	n4		
dl-PRS-MutingOption1-r16	Not present		
dl-PRS-MutingOption2-r16	Not present		
dl-PRS-ResourcePower-r16	0		
dl-PRS-ResourceList-r16 SEQUENCE (SIZE (1..nrMaxResourcesPerSet-r16)) OF NR-DL-PRS-Resource-r16 {	1 entry		
NR-DL-PRS-Resource-r16[1] SEQUENCE {		entry 1	
nr-DL-PRS-ResourceID-r16	0		
dl-PRS-SequenceID-r16	0		NR-DL-PRS-AssistanceDataPerFreq-r16[1] NR-DL-PRS-AssistanceDataPerTRP-r16[1] Table 8.4.1.6-1
	1		NR-DL-PRS-AssistanceDataPerFreq-r16[1] NR-DL-PRS-AssistanceDataPerTRP-r16[2], Table 8.4.1.6-1
	2		NR-DL-PRS-AssistanceDataPerFreq-r16[2] NR-DL-PRS-AssistanceDataPerTRP-r16[1] Table 8.4.1.6-1
dl-PRS-CombSizeN-AndReOffset-r16 CHOICE {			

n2-r16	0		NR-DL-PRS-AssistanceDataPerFreq-r16[1] NR-DL-PRS-AssistanceDataPerTRP-r16[1] Table 8.4.1.6-1
	1		NR-DL-PRS-AssistanceDataPerFreq-r16[1] NR-DL-PRS-AssistanceDataPerTRP-r16[2] Table 8.4.1.6-1
	0		NR-DL-PRS-AssistanceDataPerFreq-r16[2] NR-DL-PRS-AssistanceDataPerTRP-r16[1] Table 8.4.1.6-1
}			
dl-PRS-ResourceSlotOffset-r16	0		
dl-PRS-ResourceSymbolOffset-r16	0		
dl-PRS-QCL-Info-r16	Not present		
dl-PRS-ResourcePrioritySubset-r17	Not present	Rel-17 onwards	
}			
}			
}			
}			
}			

8.4.1.7 DL-AoD Assistance Data Elements

This clause defines the DL-AoD assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages in addition to those defined in Table 8.4.1.6-1 and Table 8.4.1.6-2 and Table 8.4.1.6-3.

- NR-PositionCalculationAssistance

Table 8.4.1.7-1: NR-PositionCalculationAssistance

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-PositionCalculationAssistance-r16 ::= SEQUENCE {			
nr-TRP-LocationInfo-r16 SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF NR-TRP-LocationInfoPerFreqLayer-r16 {	2 entries		
NR-TRP-LocationInfoPerFreqLayer-r16[1] SEQUENCE {		entry1	
referencePoint-r16			
trp-LocationInfoList-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF TRP-LocationInfoElement-r16 {	2 entries		
TRP-LocationInfoElement-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	0		
nr-PhysCellID-r16	Not present		
nr-CellGlobalID-r16	Not present		
nr-ARFCN-r16	Not present		
associated-DL-PRS-ID-r16	Not present		
trp-Location-r16	Not present	Same as the reference point location	
trp-DL-PRS-ResourceSets-r16	Not present		
}			
TRP-LocationInfoElement-r16[2] SEQUENCE {		entry 2	In case of sub-test 20/27/31 UE-based DL-AoD or sub-test 21/28/32 DL-TDOA method supported by the UE as defined in clause 8.2.10 and clause 8.2.11.
dl-PRS-ID-r16	1		
nr-PhysCellID-r16	Not present		
nr-CellGlobalID-r16	Not present		
nr-ARFCN-r16	Not present		
associated-DL-PRS-ID-r16	Not present		
trp-Location-r16	trp-Location-r16 for NR cell 2 as defined in 37.571-5 [12]		
trp-DL-PRS-ResourceSets-r16	Not present		
}			
}			
}			
NR-TRP-LocationInfoPerFreqLayer-r16[2] SEQUENCE {		entry 2	
referencePoint-r16	Not present	Same as in the previous entry of the NR-TRP-LocationInfoPerFreqLayer list.	
trp-LocationInfoList-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF TRP-LocationInfoElement-r16 {	1 entry		
TRP-LocationInfoElement-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	2		
nr-PhysCellID-r16	Not present		
nr-CellGlobalID-r16	Not present		
nr-ARFCN-r16	Not present		

associated-DL-PRS-ID-r16	Not present		
trp-Location-r16	trp-Location-r16 for NR cell 3 as defined in TS 37.571-5 [12]		
trp-DL-PRS-ResourceSets-r16	Not present		
}			
}			
}			
}			
nr-DL-PRS-BeamInfo-r16	Not present		
nr-RTD-Info-r16	Not present		
nr-TRP-BeamAntennaInfo-r17	Not present	Rel-17 onwards	
nr-DL-PRS-Expected-LOS-NLOS-Assistance-r17	Not present	Rel-17 onwards	
nr-DL-PRS-TRP-TEG-Info-r17	Not present	Rel-17 onwards	
}			

8.4.1.8 DL-TDOA Assistance Data Elements

The DL-TDOA assistance data elements which shall be provided to the UE in the tests in LPP Provide Assistance Data messages are defined in Table 8.4.1.6-1, Table 8.4.1.6-2, Table 8.4.1.6-3 and Table 8.4.1.7-1.

9 Protocol Conformance Test Cases for NR

9.1 FFS

9.2 FFS

9.3 LPP Procedures

9.3.1 LPP Common Procedures

9.3.1.1 Position Capability Transfer

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.1.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a LPP message of type REQUEST CAPABILITIES }
    then { UE sends a LPP message of type PROVIDE CAPABILITIES with the correct supported
capabilities }
}
```

9.3.1.1.2 Conformance requirements

As defined in clause 7.3.1.1.2.

9.3.1.1.3 Test description

9.3.1.1.3.1 Pre-test conditions

System Simulator:

- For Test Configuration B (Table 9.3.1.1.3.2-1): NR Cell 1.
- For Test Configuration D (Table 9.3.1.1.3.2-1): LTE Cell 1.

UE:

-

Preamble:

- For Test Configuration B (Table 9.3.1.1.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- For Test Configuration D (Table 9.3.1.1.3.2-1): FFS

Related PICS/PIXIT Statements:

-

9.3.1.1.3.2 Test procedure sequence

Table 9.3.1.1.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.1.1
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour is as defined in Table 7.3.1.1.3.2-1.

9.3.1.1.3.3 Specific message contents

As defined in clause 7.3.1.1.3.3, with the following exceptions:

Table 9.3.1.1.3.3-1 replaces Table 7.3.1.1.3.3-1, Table 9.3.1.1.3.3-2 replaces Table 7.3.1.1.3.3-2, Table 9.3.1.1.3.3-3 replaces Table 7.3.1.1.3.3-4 and Table 9.3.1.1.3.3-4 replaces Table 7.3.1.1.3.3-5.

Table 9.3.1.1.3.3-1: *DLInformationTransfer* (steps 1 and 2a, Table 7.3.1.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.1.1.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.1.1.3.3-2: DL NAS TRANSPORT (steps 1 and 2a, Table 7.3.1.1.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1:** Set according to Table 8.4-2	LPP Request Capabilities	
	Step 2a: Set according to Table 7.3.1.1.3.3-14	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.1.1.3.3-2A: Void

Table 9.3.1.1.3.3-3: *ULInformationTransfer* (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.1.1.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.1.1.3.3-4: UL NAS TRANSPORT (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	Set according to Table 9.3.1.1.3.3-5	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.1.1.3.2-1)	

Table 9.3.1.1.3.3-5: LPP PROVIDE CAPABILITIES (step 2, Table 7.3.1.1.3.2-1)

Derivation Path: Table 7.3.1.1.3.3-6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.1.1.3.3-6 with the following exception:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-ECID-ProvideCapabilities-r16	Present or not present dependent on pc_NR_ECID. Set according to Table 9.3.1.1.3.3-6.	Rel-16 onwards	
nr-Multi-RTT-ProvideCapabilities-r16 SEQUENCE {	Present or not present dependent on pc_Multi_RTT.	Rel-16 onwards	
nr-Multi-RTT-PRS-Capability-r16	Set according to Table 9.3.1.1.3.3-7		
nr-Multi-RTT-MeasurementCapability-r16	Set according to Table 9.3.1.1.3.3-8		
nr-DL-PRS-QCL-ProcessingCapability-r16	Set according to Table 9.3.1.1.3.3-9		
nr-DL-PRS-ProcessingCapability-r16	Set according to Table 9.3.1.1.3.3-10		
nr-UL-SRS-Capability-r16	Set according to Table 9.3.1.1.3.3-11		
additionalPathsReport-r16	Dependent on UE capabilities		
periodicalReporting-r16	Dependent on UE capabilities		
ten-ms-unit-ResponseTime-r17	Not checked	Rel-17 onwards	
nr-DL-PRS-ExpectedAoD-or-AoA-Sup-r17	Not checked	Rel-17 onwards	
nr-Multi-RTT-On-Demand-DL-PRS-Support-r17 SEQUENCE {			
nr-on-demand-DL-PRS-InformationSup-r17	Not checked	Rel-17 onwards	
nr-on-demand-DL-PRS-ConfigurationsSup-r17	Not checked	Rel-17 onwards	
}			
nr-UE-RxTx-TEG-ID-ReportingSupport-r17	Not checked	Rel-17 onwards	
nr-los-nlos-IndicatorSupport-r17 SEQUENCE {			
type-r17	Not checked	Rel-17 onwards	
granularity-r17	Not checked	Rel-17 onwards	
}			
additionalPathsExtSupport-r17	Not checked	Rel-17 onwards	
scheduledLocationRequestSupported-r17	Not checked	Rel-17 onwards	
nr-dl-prs-AssistanceDataValidity-r17	Not checked	Rel-17 onwards	
multiMeasInSameMeasReport-r17	Not checked	Rel-17 onwards	
mg-ActivationRequest-r17	Dependent on UE capabilities	Rel-17 onwards	pc_mg_ActivationRequest_Multi_RTT
posMeasGapSupport-r17	Dependent on UE capabilities	Rel-17 onwards	pc_posMeasGapSupport_Multi_RTT
}			

nr-DL-AoD-ProvideCapabilities-r16 SEQUENCE {	Present or not present dependent on (pc_UEA_DL_AoD OR pc_UEB_DL_AoD).	Rel-16 onwards	
nr-DL-AoD-Mode-r16	Dependent on UE capabilities		
nr-DL-AoD-PRS-Capability-r16	Set according to Table 9.3.1.1.3.3-7.		
nr-DL-AoD-MeasurementCapability-r16	Set according to Table 9.3.1.1.3.3-12.		
nr-DL-PRS-QCL-ProcessingCapability-r16	Set according to Table 9.3.1.1.3.3-9.		
nr-DL-PRS-ProcessingCapability-r16	Set according to Table 9.3.1.1.3.3-10.		
periodicalReporting-r16	Dependent on UE capabilities		
ten-ms-unit-ResponseTime-r17	Not checked	Rel-17 onwards	
nr-PosCalcAssistanceSupport-r17	Not checked	Rel-17 onwards	
nr-los-nlos-AssistanceDataSupport-r17 SEQUENCE {			
type-r17	Not checked	Rel-17 onwards	
granularity-r17	Not checked	Rel-17 onwards	
}			
nr-DL-PRS-ExpectedAoD-or-AoA-Sup-r17	Not checked	Rel-17 onwards	
dl-PRS-ResourcePrioritySubset-Sup-r17	Not checked	Rel-17 onwards	
nr-DL-PRS-BeamInfoSup-r17	Not checked	Rel-17 onwards	
nr-DL-AoD-On-Demand-DL-PRS-Support-r17 SEQUENCE {			
nr-on-demand-DL-PRS-InformationSup-r17	Not checked	Rel-17 onwards	
nr-on-demand-DL-PRS-ConfigurationsSup-r17	Not checked	Rel-17 onwards	
}			
nr-los-nlos-IndicatorSupport-r17 SEQUENCE {			
type-r17	Not checked	Rel-17 onwards	
granularity-r17	Not checked	Rel-17 onwards	
}			
scheduledLocationRequestSupported-r17	Not checked	Rel-17 onwards	
nr-dl-prs-AssistanceDataValidity-r17	Not checked	Rel-17 onwards	
multiMeasInSameMeasReport-r17	Not checked	Rel-17 onwards	
mg-ActivationRequest-r17	Dependent on UE capabilities	Rel-17 onwards	pc_mg_ActivationRequest_DL_AoD
posMeasGapSupport-r17	Dependent on UE capabilities	Rel-17 onwards	pc_posMeasGapSupport_DL_AoD
}			
nr-DL-TDOA-ProvideCapabilities-r16 SEQUENCE {	Present or not present dependent on (pc_UEA_DL_TDOA OR pc_UEB_DL_TDOA)	Rel-16 onwards	
nr-DL-TDOA-Mode-r16	Dependent on UE capabilities		
nr-DL-TDOA-PRS-Capability-r16	Set according to Table 9.3.1.1.3.3-7.		
nr-DL-TDOA-MeasurementCapability-r16	Set according to Table 9.3.1.1.3.3-13.		
nr-DL-PRS-QCL-ProcessingCapability-r16	Set according to Table 9.3.1.1.3.3-9.		
nr-DL-PRS-ProcessingCapability-r16	Set according to Table 9.3.1.1.3.3-10.		
additionalPathsReport-r16	Dependent on UE capabilities		

periodicalReporting-r16	Dependent on UE capabilities		
ten-ms-unit-ResponseTime-r17	Not checked	Rel-17 onwards	
nr-PosCalcAssistanceSupport-r17	Not checked	Rel-17 onwards	
nr-los-nlos-AssistanceDataSupport-r17 SEQUENCE {			
type-r17	Not checked	Rel-17 onwards	
granularity-r17	Not checked	Rel-17 onwards	
}			
nr-DL-PRS-ExpectedAoD-or-AoA-Sup-r17	Not checked	Rel-17 onwards	
nr-DL-TDOA-On-Demand-DL-PRS-Support-r17 SEQUENCE {			
nr-on-demand-DL-PRS-InformationSup-r17	Not checked	Rel-17 onwards	
nr-on-demand-DL-PRS-ConfigurationsSup-r17	Not checked	Rel-17 onwards	
}			
nr-los-nlos-IndicatorSupport-r17 SEQUENCE {			
type-r17	Not checked	Rel-17 onwards	
granularity-r17	Not checked	Rel-17 onwards	
}			
additionalPathsExtSupport-r17	Not checked	Rel-17 onwards	
scheduledLocationRequestSupported-r17	Not checked	Rel-17 onwards	
nr-dl-prs-AssistanceDataValidity-r17	Not checked	Rel-17 onwards	
multiMeasInSameMeasReport-r17	Not checked	Rel-17 onwards	
mg-ActivationRequest-r17	Dependent on UE capabilities	Rel-17 onwards	pc_mg_ActivationRequest_DL_TDOA
posMeasGapSupport-r17	Dependent on UE capabilities	Rel-17 onwards	pc_posMeasGapSupport_DL_TDOA
}			
nr-UL-ProvideCapabilities-r16 SEQUENCE {	Present or not present and value dependent on UE capabilities.	Rel-16 onwards	
nr-UL-SRS-Capability-r16	Set according to Table 9.3.1.1.3.3-11		
nr-UE-TEG-Capability-r17	Set according to Table 9.3.1.1.3.3-14	Rel-17 onwards	
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.3.1.1.3.3-6: NR-ECID-ProvideCapabilities (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.5.9.4			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-ECID-ProvideCapabilities-r16 ::= SEQUENCE {		Rel-16 onwards	
nr-ECID-MeasSupported-r16	Dependent on UE capabilities		
periodicalReporting-r16	Dependent on UE capabilities		
triggeredReporting-r16	Dependent on UE capabilities		
ten-ms-unit-ResponseTime-r17	Not checked	Rel-17 onwards	
scheduledLocationRequestSupported-r17	Not checked	Rel-17 onwards	
}			

Table 9.3.1.1.3.3-7: NR-DL-PRS-ResourcesCapability-r16 (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-PRS-ResourcesCapability-r16 ::= SEQUENCE {		Rel-16 onwards	
maxNrOfDL-PRS-ResourceSetPerTrpPerFrequencyLayer-r16	Dependent on UE capabilities		
maxNrOfTRP-AcrossFreqs-r16	Dependent on UE capabilities		
maxNrOfPosLayer-r16	Dependent on UE capabilities		
dl-PRS-ResourcesCapabilityBandList-r16 SEQUENCE (SIZE (1..n)) OF SEQUENCE {		Size n of SEQUENCE is dependent on UE capabilities	
freqBandIndicatorNR-r16	Dependent on UE capabilities		
maxNrOfDL-PRS-ResourcesPerResourceSet-r16	Dependent on UE capabilities		
maxNrOfDL-PRS-ResourcesPerPositioningFrequencylayer-r16	Dependent on UE capabilities		
}			
dl-PRS-ResourcesBandCombinationList-r16 SEQUENCE (SIZE (1..n)) OF SEQUENCE {		Size n of SEQUENCE is dependent on UE capabilities	
bandList-r16	Not checked		
maxNrOfDL-PRS-ResourcesAcrossAllFL-TRP-ResourceSet-r16	Dependent on UE capabilities		
}			
}			

Table 9.3.1.1.3.3-8: NR-Multi-RTT-MeasurementCapability-r16 (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.5.12.6			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-Multi-RTT-MeasurementCapability-r16 ::= SEQUENCE {		Rel-16 onwards	
maxNrOfRx-TX-MeasFR1-r16	Dependent on UE capabilities		
maxNrOfRx-TX-MeasFR2-r16	Dependent on UE capabilities		
supportOfRSRP-MeasFR1-r16	Dependent on UE capabilities		
supportOfRSRP-MeasFR2-r16	Dependent on UE capabilities		
srs-AssocPRS-MultiLayersFR1-r16	Dependent on UE capabilities		
srs-AssocPRS-MultiLayersFR2-r16	Dependent on UE capabilities		
nr-UE-TEG-Capability-r17	Set according to Table 9.3.1.1.3.3-14		
multi-RTT-MeasCapabilityBandList-r17 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r17	Not ckecked		
supportOfDL-PRS-FirstPathRSRP-r17	Not checked	Rel-17 onwards	
dl-PRS-MeasRRC-Inactive-r17	Not checked	Rel-17 onwards	
}			
}			

Table 9.3.1.1.3.3-9: NR-DL-PRS-QCL-ProcessingCapability-r16 (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-PRS-QCL-ProcessingCapability-r16 ::= SEQUENCE {		Rel-16 onwards	
dl-PRS-QCL-ProcessingCapabilityBandList-r16 SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r16	Dependent on UE capabilities		
ssb-FromNeighCellAsQCL-r16	Dependent on UE capabilities		
prs-FromServNeighCellAsQCL-r16	Dependent on UE capabilities		
}			
}			

Table 9.3.1.1.3.3-10: NR-DL-PRS-ProcessingCapability-r16 (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-PRS-ProcessingCapability-r16 ::= SEQUENCE {		Rel-16 onwards	
prs-ProcessingCapabilityBandList-r16 SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r16	Dependent on UE capabilities		
supportedBandwidthPRS-r16	Dependent on UE capabilities		
dl-PRS-BufferType-r16	Dependent on UE capabilities		
durationOfPRS-Processing-r16 SEQUENCE {			
durationOfPRS-ProcessingSymbols-r16	Dependent on UE capabilities		
durationOfPRS-ProcessingSymbolsInEveryTms-r16	Dependent on UE capabilities		
}			
maxNumOfDL-PRS-ResProcessedPerSlot-r16 SEQUENCE {			
scs15-r16	Dependent on UE capabilities		
scs30-r16	Dependent on UE capabilities		
scs60-r16	Dependent on UE capabilities		
scs120-r16	Dependent on UE capabilities		
}			
supportedDL-PRS-ProcessingSamples-RRC-CONNECTED-r17	Dependent on UE capabilities	Rel-17 onwards	pc_supportedDL_PRS_ProcessingSamples_RRC_CONNECTED
prs-ProcessingWindowType1A-r17	Dependent on UE capabilities	Rel-17 onwards	pc_prs_Proc essingWindo wType1A
prs-ProcessingWindowType1B-r17	Dependent on UE capabilities	Rel-17 onwards	pc_prs_Proc essingWindo wType1B
prs-ProcessingWindowType2-r17	Dependent on UE capabilities	Rel-17 onwards	pc_prs_Proc essingWindo wType2
prs-ProcessingCapabilityOutsideMGinPPW-r17 SEQUENCE (SIZE(1..3)) OF {	Size n of SEQUENCE is dependent on UE capabilities		
prsProcessingType-r17	Dependent on UE capabilities	Rel-17 onwards	pc_prsProcessingType
ppw-dl-PRS-BufferType-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_dl_PRS_BufferType
ppw-durationOfPRS-Processing1-r17 SEQUENCE {			
ppw-durationOfPRS-ProcessingSymbolsN-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_durationOfPRS_ProcessingSymbolsN

ppw-durationOfPRS-ProcessingSymbolsT-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_durationOfPRS_ProcessingSymbolsT
}			
ppw-durationOfPRS-Processing2-r17 SEQUENCE {			
ppw-durationOfPRS-ProcessingSymbolsN2-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_durationOfPRS_ProcessingSymbolsN2
ppw-durationOfPRS-ProcessingSymbolsT2-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_durationOfPRS_ProcessingSymbolsT2
}			
ppw-maxNumOfDL-PRS-ResProcessedPerSlot-r17 SEQUENCE {			
scs15-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_maxNumOfDL_PRS_ResProcessedPerSlot_SCS15
scs30-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_maxNumOfDL_PRS_ResProcessedPerSlot_SCS30
scs60-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_maxNumOfDL_PRS_ResProcessedPerSlot_SCS60
scs120-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_maxNumOfDL_PRS_ResProcessedPerSlot_SCS120
}			
ppw-maxNumOfDL-Bandwidth-r17	Dependent on UE capabilities	Rel-17 onwards	pc_ppw_maxNumOfDL_Bandwidth_FR1 / pc_ppw_maxNumOfDL_Bandwidth_FR2
}			
dl-PRS-BufferType-RRC-Inactive-r17	Not checked	Rel-17 onwards	
durationOfPRS-Processing-RRC-Inactive-r17 SEQUENCE {			
durationOfPRS-ProcessingSymbols-r17	Not checked	Rel-17 onwards	
durationOfPRS-ProcessingSymbolsInEveryTms-r17	Not checked	Rel-17 onwards	
}			
maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive-r17 SEQUENCE {			
scs15-r17	Not checked	Rel-17 onwards	
scs30-r17	Not checked	Rel-17 onwards	
scs60-r17	Not checked	Rel-17 onwards	
scs120-r17	Not checked	Rel-17 onwards	
}			
supportedLowerRxBeamSweepingFactor-FR2-r17	Not checked	Rel-17 onwards	
supportedDL-PRS-ProcessingSamples-RRC-Inactive-r17	Not checked	Rel-17 onwards	
prs-MeasurementWithoutMG-r17	Not checked	Rel-17 onwards	

}			
maxSupportedFreqLayers-r16	Dependent on UE capabilities		
simulLTE-NR-PRS-r16	Dependent on UE capabilities		
}			

Table 9.3.1.1.3.3-11: NR-UL-SRS-Capability-r16 (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-UL-SRS-Capability-r16 ::= SEQUENCE {		Rel-16 onwards	
srs-CapabilityBandList-r16 SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r16	Dependent on UE capabilities		
olpc-SRS-Pos-r16 SEQUENCE {			
olpc-SRS-PosBasedOnPRS-Serving-r16	Dependent on UE capabilities		
olpc-SRS-PosBasedOnSSB-Neigh-r16	Dependent on UE capabilities		
olpc-SRS-PosBasedOnPRS-Neigh-r16	Dependent on UE capabilities		
maxNumberPathLossEstimatePerServing-r16	Dependent on UE capabilities		
}			
spatialRelationsSRS-Pos-r16 SEQUENCE {			
spatialRelation-SRS-PosBasedOnSSB-Serving-r16	Dependent on UE capabilities		
spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16	Dependent on UE capabilities		
spatialRelation-SRS-PosBasedOnPRS-Serving-r16	Dependent on UE capabilities		
spatialRelation-SRS-PosBasedOnSRS-r16	Dependent on UE capabilities		
spatialRelation-SRS-PosBasedOnSSB-Neigh-r16	Dependent on UE capabilities		
spatialRelation-SRS-PosBasedOnPRS-Neigh-r16	Dependent on UE capabilities		
}			
posSRS-RRC-Inactive-InInitialUL-BWP-r17 SEQUENCE {			
maxNumOfSRSposResourceSets-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicAndSemiPersistentSRSposResources-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicAndSemiPersistentSRSposResourcesPerSlot-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicSRSposResources-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicSRSposResourcesPerSlot-r17	Not checked	Rel-17 onwards	
dummy1	Not checked	Rel-17 onwards	
dummy2	Not checked	Rel-17 onwards	
}			
posSRS-RRC-Inactive-OutsideInitialUL-BWP-r17 SEQUENCE {			
maxSRSposBandwidthForEachSCS-withinCC-FR1-r17	Not checked	Rel-17 onwards	
maxSRSposBandwidthForEachSCS-withinCC-FR2-r17	Not checked	Rel-17 onwards	
maxNumOfSRSposResourceSets-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicSRSposResources-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicSRSposResourcesPerSlot-r17	Not checked	Rel-17 onwards	
differentNumerologyBetweenSRSposAndInitialBWP-r17	Not checked	Rel-17 onwards	
srsPosWithoutRestrictionOnBWP-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicAndSemiPersistentSRSposResources-r17	Not checked	Rel-17 onwards	
maxNumOfPeriodicAndSemiPersistentSRSposResourcesPerSlot-r17	Not checked	Rel-17 onwards	
differentCenterFreqBetweenSRSposAndInitialBWP-r17	Not checked	Rel-17 onwards	
maxNumOfSemiPersistentSRSposResources-r17	Not checked	Rel-17 onwards	

maxNumOfSemiPersistentSRSposResourcesPerSlot-r17	Not checked	Rel-17 onwards	
switchingTimeSRS-TX-OtherTX-r17	Not checked	Rel-17 onwards	
}			
olpc-SRS-PosRRC-Inactive-r17 SEQUENCE {			
olpc-SRS-PosBasedOnPRS-Serving-r16	Not checked	Rel-17 onwards	
olpc-SRS-PosBasedOnSSB-Neigh-r16	Not checked	Rel-17 onwards	
olpc-SRS-PosBasedOnPRS-Neigh-r16	Not checked	Rel-17 onwards	
maxNumberPathLossEstimatePerServing-r16	Not checked	Rel-17 onwards	
}			
spatialRelationsSRS-PosRRC-Inactive-r17 SEQUENCE {			
spatialRelation-SRS-PosBasedOnSSB-Serving-r16	Not checked	Rel-17 onwards	
spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16	Not checked	Rel-17 onwards	
spatialRelation-SRS-PosBasedOnPRS-Serving-r16	Not checked	Rel-17 onwards	
spatialRelation-SRS-PosBasedOnSRS-r16	Not checked	Rel-17 onwards	
spatialRelation-SRS-PosBasedOnSSB-Neigh-r16	Not checked	Rel-17 onwards	
spatialRelation-SRS-PosBasedOnPRS-Neigh-r16	Not checked	Rel-17 onwards	
}			
posSRS-SP-RRC-Inactive-InInitialUL-BWP-r17 SEQUENCE {			
maxNumOfSemiPersistentSRSposResources-r17	Not checked	Rel-17 onwards	
maxNumOfSemiPersistentSRSposResourcesPerSlot-r17	Not checked	Rel-17 onwards	
}			
}			
srs-PosResourceConfigCA-BandList-r16 SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r16	Dependent on UE capabilities		
maxNumberSRS-PosResourceSetsPerBWP-r16	Dependent on UE capabilities		
maxNumberSRS-PosResourcesPerBWP-r16	Dependent on UE capabilities		
maxNumberPeriodicSRS-PosResourcesPerBWP-r16	Dependent on UE capabilities		
maxNumberAP-SRS-PosResourcesPerBWP-r16	Dependent on UE capabilities		
maxNumberSP-SRS-PosResourcesPerBWP-r16	Dependent on UE capabilities		
}	Dependent on UE capabilities		
maxNumberSRS-PosPathLossEstimateAllServingCells-r16	Dependent on UE capabilities		
maxNumberSRS-PosSpatialRelationsAllServingCells-r16	Dependent on UE capabilities		
}			

Table 9.3.1.1.3.3-12: NR-DL-AoD-MeasurementCapability-r16 (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.5.11.6			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-AoD-MeasurementCapability-r16 ::= SEQUENCE {		Rel-16 onwards	
maxDL-PRS-RSRP-MeasurementFR1-r16	Dependent on UE capabilities		
maxDL-PRS-RSRP-MeasurementFR2-r16	Dependent on UE capabilities		
dl-AoD-MeasCapabilityBandList-r16 SEQUENCE (SIZE (1..n)) OF SEQUENCE {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r16	Dependent on UE capabilities		
simul-NR-DL-AoD-DL-TDOA-r16	Dependent on UE capabilities		
simul-NR-DL-AoD-Multi-RTT-r16	Dependent on UE capabilities		
maxDL-PRS-FirstPathRSRP-MeasPerTRP-r17	Not checked	Rel-17 onwards	
dl-PRS-MeasRRC-Inactive-r17	Not checked	Rel-17 onwards	
}			
maxDL-PRS-RSRP-MeasurementFR1-v1730	Not checked	Rel-17 onwards	
maxDL-PRS-RSRP-MeasurementFR2-v1730	Not checked	Rel-17 onwards	
}			

Table 9.3.1.1.3.3-13: NR-DL-TDOA-MeasurementCapability (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.5.10.6			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-DL-TDOA-MeasurementCapability-r16 ::= SEQUENCE {		Rel-16 onwards	
dl-RSTD-MeasurementPerPairOfTRP-FR1-r16	Dependent on UE capabilities		
dl-RSTD-MeasurementPerPairOfTRP-FR2-r16	Dependent on UE capabilities		
supportOfDL-PRS-RSRP-MeasFR1-r16	Dependent on UE capabilities		
supportOfDL-PRS-RSRP-MeasFR2-r16	Dependent on UE capabilities		
nr-UE-TEG-Capability-r17	Set according to Table 9.3.1.1.3.3-14		
dl-tdoa-MeasCapabilityBandList-r17 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r17	Not ckecked		
supportOfDL-PRS-FirstPathRSRP-r17	Not checked	Rel-17 onwards	
dl-PRS-MeasRRC-Inactive-r17	Not checked	Rel-17 onwards	
}			
}			

Table 9.3.1.1.3.3-14: NR-UE-TEG-Capability (Table 9.3.1.1.3.3-5)

Derivation Path: 37.355 clause 6.4.3			
Information Element	**Value/remark**	**Comment**	**Condition**
NR-UE-TEG-Capability-r17 ::= SEQUENCE {		Rel-17 onwards	
nr-UE-TEG-ID-CapabilityBandList-r17 SEQUENCE (SIZE (1..nrMaxBands-r16)) OF {	Size n of SEQUENCE is dependent on UE capabilities		
freqBandIndicatorNR-r17	Not checked		
nr-UE-RxTEG-ID-MaxSupport-r17	Dependent on UE capabilities		pc_nr_UE_RxTEG_ID_MaxSupport
nr-UE-TxTEG-ID-MaxSupport-r17	Dependent on UE capabilities		pc_nr_UE_TxTEG_ID_MaxSupport
nr-UE-RxTxTEG-ID-MaxSupport-r17	Dependent on UE capabilities		pc_nr_UE_RxTxTEG_ID_MaxSupport
measureSameDL-PRS-ResourceWithDifferentRxTEGs-r17	Dependent on UE capabilities		pc_measureSameDL_PRS_ResourceWithDifferentRxTEGs
measureSameDL-PRS-ResourceWithDifferentRxTEGsSimul-r17	Dependent on UE capabilities		pc_measureSameDL_PRS_ResourceWithDifferentRxTEGsSimul
}			
}			

9.3.1.2 LPP Abort

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.1.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a LPP Abort message carrying the transaction ID of an on-going procedure }
    then { UE aborts the on-going procedure }
          }
```

9.3.1.2.2 Conformance requirements

As defined in clause 7.3.5.1.2.

9.3.1.2.3 Test description

9.3.1.2.3.1 Pre-test conditions

System Simulator:

- For Test Configuration B (Table 9.3.1.2.3.2-1):
  - Sub-tests 11, 12, 13, 15, 16, 17, 19: NR Cell 1.

- Sub-test 5: NR Cell 1 and independent LTE Cell 1, as specified in 8.2.2.
- Sub-test 20: NR Cell 1 and NR Cell 2 (only applicable to UE-Based DL-TDOA).
- Sub-test 21: NR Cell 1, NR Cell 2 and NR Cell 3 (only applicable to UE-Based DL-AoD).

- For Test Configuration D (Table 9.3.1.2.3.2-1):
  - Sub-tests 11, 12, 13, 15, 16, 17: LTE Cell 1.
  - Sub-test 5: LTE Cell 1, as specified in 8.2.2.

UE:

- The UE shall begin the tests with no assistance data stored.

Preamble:

- For Test Configuration B (Table 9.3.1.2.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
  - Sub-test 5: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.1.2.3.1-1 for the configuration of measurement gaps for OTDOA (LTE).
  - Sub-test 19: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.1.2.3.1-1 for the configuration of measurement gaps for Multi-RTT and then the SS shall execute the steps in Table 9.3.1.2.3.1-2 for the configuration of UL-SRS for Multi-RTT.
  - Sub-test 20: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.1.2.3.1-1 for the configuration of measurement gaps for DL-AoD.
  - Sub-test 21: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.1.2.3.1-1 for the configuration of measurement gaps for DL-TDOA.

Table 9.3.1.2.3.1-1: Configuration of measurement gaps

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.1-1.	**<--**	RRCReconfiguration	**-**	**-**
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

Table 9.3.1.2.3.1-2: Configuration of UL-SRS for Multi-RTT

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.2-1.	**<--**	RRCReconfiguration	**-**	**-**
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

- For Test Configuration D (Table 9.3.1.2.3.2-1): FFS.

Related PICS/PIXIT Statements:

-

9.3.1.2.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.3.1.2.3.2-0 below:

Table 9.3.1.2.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
5	UE supporting OTDOA (LTE) (Rel-15 onwards)
11	UE supporting WLAN (Rel-13 only)
12	UE supporting MBS (Rel-13 only)
13	UE supporting Bluetooth
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
19	UE supporting Multi-RTT (Rel-16 onwards)
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Note that this test case does not include a sub-test for the case where ECID (LTE), NR E-CID or Sensor is supported by the UE as the behaviour required cannot be guaranteed in these cases.

Table 9.3.1.2.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.5.1
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour is as defined in Table 7.3.5.1.3.2-1.

9.3.1.2.3.3 Specific message contents

As defined in clause 7.3.5.1.3.3, with the following exceptions:

Table 9.3.1.2.3.3-0 replaces Table 7.3.5.1.3.3-0, Table 9.3.1.2.3.3-1 replaces Table 7.3.5.1.3.3-1, Table 9.3.1.2.3.3-2 replaces Table 7.3.5.1.3.3-2, Table 9.3.1.2.3.3-2a replaces Table 7.3.5.1.3.3-2c, Table 9.3.1.2.3.3-2b replaces Table 7.3.5.1.3.3-2d, Table 9.3.1.2.3.3-3 replaces Table 7.3.5.1.3.3-5, Table 9.3.1.2.3.3-4 replaces Table 7.3.5.1.3.3-6, Table 9.3.1.2.3.3-5 replaces Table 7.3.5.1.3.3-3 and Table 9.3.1.2.3.3-6 replaces Table 7.3.5.1.3.3-7.

Table 9.3.1.2.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 00, Table 7.3.5.1.3.2-1)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.5.1.3.3-0 with the following exceptions:			
UE Positioning Technology	Sub-test 19: 0 0 0 0 0 1 1 0 Sub-test 20: 0 0 0 0 1 0 0 0 Sub-test 21: 0 0 0 0 0 1 1 1	Sub-test 19: Multi-RTT Sub-test 20: DL-AoD Sub-test 21: DL-TDOA	

Table 9.3.1.2.3.3-1: *DLInformationTransfer* (steps 0, 0b, 0c, 1 and 2, Table 7.3.5.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.1.2.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.1.2.3.3-2: DL NAS TRANSPORT (steps 0, 0b, 0c, 1 and 2, Table 7.3.5.1.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 0:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 0b: Set according to Table 7.3.5.1.3.3-2b	LPP Acknowledgement	
	Step 0c: Set according to Table 9.3.1.2.3.3-2a	LPP Provide Assistance Data	
	Step 1: Set according to Table 9.3.1.2.3.3-5	LPP Request Location Information	
	Step 2: Set according to Table 7.3.5.1.3.3-4	LPP Abort	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.1.2.3.3-2a: LPP Provide Assistance Data (step 0c, Table 7.3.5.1.3.2-1)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			
OTDOA-NeighbourCellInfoList ::= SEQUENCE (SIZE(1)) OF SEQUENCE {			Sub-test 5
SEQUENCE (SIZE(18)) OF SEQUENCE {	Sequence contains 18 instances of the following data.		
physCellId	Refer to Sequence data values in Table 9.3.1.2.3.3-2b		
cellGlobalId	For values of cellidentity refer to Sequence data values in Table 9.3.1.2.3.3-2b		
earfcn	Not present	Same as for the reference cell	
cpLength	Not present	Same as for the reference cell	
prsInfo	Not present	Same as for the reference cell	
antennaPortConfig	Not present	Same as for the reference cell	
slotNumberOffset	Not present	Same as for the reference cell	
prs-SubframeOffset	Not present	Same as for the reference cell	
expectedRSTD	Refer to Sequence data values in Table 9.3.1.2.3.3-2b		
expectedRSTD-Uncertainty	Refer to Sequence data values in Table 9.3.1.2.3.3-2b		
earfcn-v9a0	Not present	Same as for the reference cell	
tpId-r14	Not present	Transmission Points not used	Rel-14 onwards
prs-only-tp-r14	Not present	Not required	Rel-14 onwards
cpLengthCRS-r14	Not present	Not required	Rel-14 onwards
sameMBSFNconfigNeighbour-r14	TRUE	Same as for the reference cell	Rel-14 onwards
dlBandwidth-r14	Not present	Same as for the reference cell and PRS frequency hopping not used	Rel-14 onwards
addPRSconfigNeighbour-r14	Not present	No additional PRS configuration(s)	Rel-14 onwards
tdd-config-v1520	Not present		Rel-15 onwards
}			
}			

Table 9.3.1.2.3.3-2b: Sequence data values for 18 instances of sequence for Table 9.3.1.2.3.3-2a

Cell	Value physCellId	Value cellidentity (E-UTRAN Cell Identity)		Value expectedRSTD	Value expectedRSTD-Uncertainty	Comment
		Value eNB ID	Value Cell Identity			
Cell 2	2	'0000 0000 0000 0000 0001'B	'0000 0010'B	8192	10	As defined for Cell 2 in 36.508 [8]
Cell 4	4	'0000 0000 0000 0000 0011'B	‘0000 0100’B	8192	10	As defined for Cell 4 in 36.508 [8]
Dummy cell	1	'0000 0000 0000 0000 0001'B	'0000 0001'B	8253	51	
Dummy cell	3	'0000 0000 0000 0000 0010'B	'0000 0011'B	8211	51	
Dummy cell	6	'0000 0000 0000 0000 0100'B	'0000 0110'B	8221	51	
Dummy cell	7	'0000 0000 0000 0000 0110'B	‘0000 0111’B	8192	51	
Dummy cell	8	'0000 0000 0000 0000 0010'B	'0000 1000'B	8233	51	
Dummy cell	9	'0000 0000 0000 0000 0100'B	‘0000 1001’B	8161	51	
Dummy cell	10	'0000 0000 0000 0000 0101'B	'0000 1010'B	8226	51	
Dummy cell	11	'0000 0000 0000 0000 0110'B	'0000 1011'B	8232	51	
Dummy cell	16	'0000 0000 0000 0000 0010'B	'0001 0000'B	8223	51	
Dummy cell	111	'0000 0000 0000 0000 1100'B	'0110 1111'B	8236	51	
Dummy cell	118	'0000 0000 0000 0000 1111'B	‘0111 0110’B	8223	51	
Dummy cell	119	'0000 0000 0000 0000 1110'B	‘0111 0111’B	8221	51	
Dummy cell	120	'0000 0000 0000 0000 1111'B	‘0111 1000’B	8223	51	
Dummy cell	122	'0000 0000 0000 0000 1010'B	‘0111 1010’B	8243	51	
Dummy cell	125	'0000 0000 0000 0000 1011'B	‘0111 1101’B	8253	51	
Dummy cell	126	'0000 0000 0000 0000 1100'B	‘0111 1110’B	8257	51	

Table 9.3.1.2.3.3-3: *ULInformationTransfer* (step 0a, Table 7.3.5.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.1.2.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.1.2.3.3-4: UL NAS TRANSPORT (step 0a, Table 7.3.5.1.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	Set according to Table 9.3.1.1.3.3-5	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.1.1.3.2-1)	

Table 9.3.1.2.3.3-5: LPP Request Location Information (step 1, Table 7.3.5.1.3.2-1)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	0		
}			
locationInformationType	locationEstimateRequired	In case of "UE-based" Location method supported by the UE	
	locationMeasurementsRequired	In case of "UE-assisted" Location method supported by the UE	
time	10		

Table 9.3.1.2.3.3-6: LPP Provide Capabilities (step 0a, Table 7.3.5.1.3.2-1)

Derivation Path: Table 7.3.5.1.3.3-7			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table ith the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-ECID-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

9.3.2 LPP Transport

9.3.2.1 LPP Duplicated Message

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.2.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a LPP message carrying the same sequence number as that last received for the
         associated location session }
    then { UE discards the LPP message }
}
```

9.3.2.1.2 Conformance requirements

As defined in clause 7.3.2.1.2.

9.3.2.1.3 Test description

9.3.2.1.3.1 Pre-test conditions

System Simulator:

- For Test Configuration B (Table 9.3.2.1.3.2-1): NR Cell 1.
- For Test Configuration D (Table 9.3.2.1.3.2-1): LTE Cell 1.

UE:

-

Preamble:

- For Test Configuration B (Table 9.3.2.1.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- For Test Configuration D (Table 9.3.2.1.3.2-1): FFS.

Related PICS/PIXIT Statements:

-

9.3.2.1.3.2 Test procedure sequence

Table 9.3.2.1.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.2.1
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour is as defined in Table 7.3.2.1.3.2-1.

9.3.2.1.3.3 Specific message contents

As defined in clause 7.3.2.1.3.3, with the following exceptions:

Table 9.3.2.1.3.3-1 replaces Table 7.3.2.1.3.3-1, Table 9.3.2.1.3.3-2 replaces Table 7.3.2.1.3.3-2, Table 9.3.2.1.3.3-3 replaces Table 7.3.2.1.3.3-4, Table 9.3.2.1.3.3-4 replaces Table 7.3.2.1.3.3-5, Table 9.3.2.1.3.3-2a replaces Table 7.3.2.1.3.3-3 and Table 9.3.2.1.3.3-5 replaces Table 7.3.2.1.3.3-6.

Table 9.3.2.1.3.3-1: *DLInformationTransfer* (steps 1, 2, and 3a, Table 7.3.2.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.2.1.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.2.1.3.3-2: DL NAS TRANSPORT (steps 1, 2 and 3a, Table 7.3.2.1.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1 and 2:** Set according to Table 9.3.2.1.3.3-2a	LPP Request Capabilities	
	Step 3a: Set according to Table 7.3.2.1.3.3-7	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.2.1.3.3-2a: LPP Request Capabilities (steps 1 and 2, Table 7.3.2.1.3.2-1)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
sequenceNumber	0		

Table 9.3.2.1.3.3-3: *ULInformationTransfer* (step 3, Table 7.3.2.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.2.1.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.2.1.3.3-4: UL NAS TRANSPORT (step 3, Table 7.3.2.1.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	Set according to Table 9.3.2.1.3.3-5	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.2.1.3.2-1)	

Table 9.3.2.1.3.3-5: LPP Provide Capabilities (step 3, Table 7.3.2.1.3.2-1)

Derivation Path: Table 7.3.2.2.3.3-6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.2.2.3.3-6 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-ECID-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

9.3.2.2 LPP Acknowledgment

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.2.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives a LPP message carrying an acknowledgement request indicator  }
    then { UE returns an acknowledgement response }
          }
```

9.3.2.2.2 Conformance requirements

As defined in clause 7.3.2.2.2.

9.3.2.2.3 Test description

9.3.2.2.3.1 Pre-test conditions

System Simulator:

- For Test Configuration B (Table 9.3.2.2.3.2-1): NR Cell 1.
- For Test Configuration D (Table 9.3.2.2.3.2-1): LTE Cell 1.

UE:

-

Preamble:

- For Test Configuration B (Table 9.3.2.2.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- For Test Configuration D (Table 9.3.2.2.3.2-1): FFS.

Related PICS/PIXIT Statements:

-

9.3.2.2.3.2 Test procedure sequence

Table 9.3.2.2.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.2.2
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour as defined in Table 7.3.2.2.3.2-1.

9.3.2.2.3.3 Specific message contents

As defined in clause 7.3.2.2.3.3, with the following exceptions:

Table 9.3.2.2.3.3-1 replaces Table 7.3.2.2.3.3-1, Table 9.3.2.2.3.3-2 replaces Table 7.3.2.2.3.3-2, Table 9.3.2.2.3.3-3 replaces Table 7.3.2.2.3.3-4, Table 9.3.2.2.3.3-4 replaces Table 7.3.2.2.3.3-5, Table 9.3.2.2.3.3-2a replaces Table 7.3.2.2.3.3-3 and Table 9.3.2.2.3.3-5 replaces Table 7.3.2.2.3.3-6.

Table 9.3.2.2.3.3-1: *DLInformationTransfer* (steps 1, and 3, Table 7.3.2.2.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.2.2.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.2.2.3.3-2: DL NAS TRANSPORT (steps 1, and 3, Table 7.3.2.2.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1:** Set according to Table 9.3.2.2.3.3-2a	LPP Request Capabilities	
	Step 3: Set according to Table 7.3.2.2.3.3-8	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.2.2.3.3-2a: LPP Request Capabilities (step 1, Table 7.3.2.2.3.2-1)

Derivation Path: Table 8.4-2			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-2 with the following exceptions:			
sequenceNumber	0		
acknowledgement SEQUENCE {			
ackRequested	TRUE		
ackIndicator	Not present		
}			

Table 9.3.2.2.3.3-3: *ULInformationTransfer* (step 2, Table 7.3.2.2.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.2.2.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.2.2.3.3-4: UL NAS TRANSPORT (step 2, Table 7.3.2.2.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	Set according to Table 9.3.2.2.3.3-5	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.2.2.3.2-1)	

Table 9.3.2.2.3.3-5: LPP Provide Capabilities (step 2, Table 7.3.2.2.3.2-1)

Derivation Path: Table 7.3.2.2.3.3-6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.2.2.3.3-6 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-ECID-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

9.3.2.3 LPP Retransmission

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.2.3.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection for EPC-NI-LR session existing}
ensure that {
  when { UE does not receive an LPP acknowledgement for an LPP message which requires
         acknowledgement }
    then { UE retransmits the LPP message up to three times. If still unacknowledged after that, the
           UE aborts all LPP activity for the associated session}
}
```

9.3.2.3.2 Conformance requirements

As defined in clause 7.3.2.3.2.

9.3.2.3.3 Test description

9.3.2.3.3.1 Pre-test conditions

System Simulator:

- For Test Configuration B (Table 9.3.2.3.3.2-1): NR Cell 1.
- For Test Configuration D (Table 9.3.2.3.3.2-1): LTE Cell 1.

UE:

-

Preamble:

- For Test Configuration B (Table 9.3.2.3.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- For Test Configuration D (Table 9.3.2.3.3.2-1): FFS.

Related PICS/PIXIT Statements:

-

9.3.2.3.3.2 Test procedure sequence

Table 9.3.2.3.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.2.3
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour as defined in Table 7.3.2.3.3.2-1.

9.3.2.3.3.3 Specific message contents

As defined in clause 7.3.2.3.3.3, with the following exceptions:

Table 9.3.2.3.3.3-1 replaces Table 7.3.2.3.3.3-1, Table 9.3.2.3.3.3-2 replaces Table 7.3.2.3.3.3-2, Table 9.3.2.3.3.3-3 replaces Table 7.3.2.3.3.3-4, Table 9.3.2.3.3.3-4 replaces Table 7.3.2.3.3.3-5 and Table 9.3.2.3.3.3-5 replaces Table 7.3.2.3.3.3-6.

Table 9.3.2.3.3.3-1: *DLInformationTransfer* (step 1, Table 7.3.2.3.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.2.3.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.2.3.3.3-2: DL NAS TRANSPORT (steps 1 and 2a, Table 7.3.2.3.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	Set according to Table 8.4-2	LPP Request Capabilities	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.2.3.3.3-3: *ULInformationTransfer* (steps 2, 4, 6, and 8, Table 7.3.2.3.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.2.3.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.2.3.3.3-4: UL NAS TRANSPORT (steps 2, 4, 6, and 8, Table 7.3.2.3.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	Set according to Table Table 9.3.2.3.3.3-5	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.2.3.3.2-1)	

Table 9.3.2.3.3.3-5: LPP Provide Capabilities (steps 2, 4, 6, and 8, Table 7.3.2.3.3.2-1)

Derivation Path: Table 7.3.2.3.3.3-6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.2.3.3.3-6 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-ECID-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

9.3.3 LPP Error Handling

9.3.3.1 Void

9.3.3.1A Void

9.3.3.1B LPP Requested Method not Supported – UE-Assisted

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.3.1B.1 Test Purpose (TP)

(1)

```
with {  a UE supporting at least one of UE-assisted GNSS, UE-assisted OTDOA (LTE) (LPP Rel-15
onwards), UE-assisted ECID (LTE) (Test Configuration D only), UE-assisted WLAN, UE-assisted
Bluetooth, UE-assisted Sensor, UE-assisted MBS, UE-assisted DL-TDOA, UE-assisted DL-AoD, UE-assisted
Multi-RTT or UE-assisted NR E-CID but not all of them }
and with { a NAS signalling connection existing }
ensure that {
  when { UE receives a LPP message requesting at least one location method not supported }
    then { the UE provides location information for the supported methods}
}
```

9.3.3.1B.2 Conformance requirements

As defined in clause 7.3.3.1B.2.

9.3.3.1B.3 Test description

9.3.3.1B.3.1 Pre-test conditions

System Simulator:

For Test Configuration B (Table 9.3.3.1B.3.2-1):

- If GNSS is supported by the UE: NR Cell 1 and satellite signals, as specified in 8.2.1.
- If OTDOA (LTE) is supported by the UE: NR Cell 1 independent and LTE Cell 1 and LTE Cell 2 as specified in 8.2.2.
- If WLAN is supported by the UE: NR Cell 1 and WLAN signals, as specified in 8.2.5.
- If Bluetooth is supported by the UE: NR Cell 1 and Bluetooth signals, as specified in 8.2.6.
- If Sensor is supported by the UE: NR Cell 1.
- If MBS is supported by the UE: NR Cell 1 and MBS signals, as specified in 8.2.4.
- If DL-TDOA is supported by the UE: NR Cell 1 and NR Cell 2, as specified in 8.2.11.
- If DL-AoD is supported by the UE: NR Cell 1, as specified in 8.2.10.
- If Multi-RTT is supported by the UE: NR Cell 1, as specified in 8.2.9.
- If NR E-CID is supported by the UE: NR Cell 1, as specified in 8.2.12.

For Test Configuration D (Table 9.3.3.1B.3.2-1):

- If GNSS is supported by the UE: LTE Cell 1 and satellite signals, as specified in 8.2.1.

- If OTDOA (LTE) is supported by the UE: LTE Cell 1 and LTE Cell 2, as specified in 8.2.2
- If ECID (LTE) is supported by the UE: LTE Cell 1 and LTE Cell 2, as specified in 8.2.3.
- If WLAN is supported by the UE: LTE Cell 1 and WLAN signals, as specified in 8.2.5.
- If Bluetooth is supported by the UE: LTE Cell 1 and Bluetooth signals, as specified in 8.2.6.
- If Sensor is supported by the UE: LTE Cell 1.
- If MBS is supported by the UE: LTE Cell 1 and MBS signals, as specified in 8.2.4.

UE:

-

Preamble:

- For Test Configuration B (Table 9.3.3.1B.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
  - If OTDOA (LTE) is supported by the UE then after the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.3.1B.3.1-1 for the configuration of measurement gaps for OTDOA (LTE).
  - If DL-TDOA is supported by the UE then after the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.3.1B.3.1-1 for the configuration of measurement gaps for DL-TDOA.
  - If DL-AoD is supported by the UE then after the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.3.1B.3.1-1 for the configuration of measurement gaps for DL-AoD.
  - If Multi-RTT is supported by the UE then after the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.3.1B.3.1-1 for the configuration of measurement gaps for Multi-RTT and then the SS shall execute the steps in Table 9.3.3.1B.3.1-2 for the configuration of UL-SRS for Multi-RTT.

Table 9.3.3.1B.3.1-1: Configuration of measurement gaps

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.1-1.	**<--**	RRCReconfiguration	**-**	**-**
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

Table 9.3.3.1B.3.1-2: Configuration of UL-SRS for Multi-RTT

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.2-1.	**<--**	RRCReconfiguration	**-**	**-**
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

- For Test Configuration D (Table 9.3.3.1B.3.2-1): FFS.

Related PICS/PIXIT Statements:

-

9.3.3.1B.3.2 Test procedure sequence

Table 9.3.3.1B.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.3.1B
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour as defined in clause 7.3.3.1B.3.2.

9.3.3.1B.3.3 Specific message contents

As defined in clause 7.3.3.1B.3.3, with the following exceptions:

Table 9.3.3.1B.3.3-1 replaces Table 7.3.3.1B.3.3-1, Table 9.3.3.1B.3.3-2 replaces Table 7.3.3.1B.3.3-2, Table 9.3.3.1B.3.3-2a replaces Table 7.3.3.1B.3.3-3, Table 9.3.3.1B.3.3-3 replaces Table 7.3.3.1B.3.3-5, Table 9.3.3.1B.3.3-4 replaces Table 7.3.3.1B.3.3-6, Table 9.3.3.1B.3.3.5 replaces Table 7.3.3.1B.3.3-4, Table 9.3.3.1B.3.3.6 replaces Table 7.3.3.1B.3.3-6a and Table 9.3.3.1B.3.3-7 replaces Table 7.3.3.1B.3.3-7.

Table 9.3.3.1B.3.3-1: *DLInformationTransfer* (steps 0, 0b, 1, 2 and 3a, Table 7.3.3.1B.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.3.1B.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.3.1B.3.3-2: DL NAS TRANSPORT (steps 0, 0b, 1, 2 and 3a, Table 7.3.3.1B.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 0:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 1: Set according to Table 9.3.3.1B.3.3-2a	LPP Provide Assistance Data	
	Step 2: Set according to Table 9.3.3.1B.3.3-5	LPP Request Location Information	
	Steps 0b and 3a: Set according to Table 7.3.3.1B.3.3-8	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.3.1B.3.3-2a: LPP Provide Assistance data (step 1, Table 7.3.3.1B.3.2-1)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
transactionID SEQUENCE {			
Initiator	locationServer		
transactionNumber	(0..255)		
}			
a-gnss-ProvideAssistanceData	Present for all supported GNSSs if UE supports UE-assisted A-GNSS. As defined in clause 8.4		
otdoa-ProvideAssistanceData	Present if UE supports UE-assisted OTDOA (LTE). As defined in clause 8.4		
sensor-ProvideAssistanceData-r14	Present if UE supports UE-assisted Sensor. As defined in clause 8.4	Rel-14 onwards	
tbs-ProvideAssistanceData-r14	Present if UE supports UE-assisted MBS. As defined in clause 8.4	Rel-14 onwards	
wlan-ProvideAssistanceData-r14	Present if UE supports UE-assisted WLAN. As defined in clause 8.4	Rel-14 onwards	
nr-Multi-RTT-ProvideAssistanceData	Present if UE supports UE-assisted Multi-RTT. As defined in clause 8.4	Rel-16 onwards	
nr-DL-AoD-ProvideAssistanceData-r16	Present if UE supports UE-assisted DL-AoD. As defined in clause 8.4	Rel-16 onwards	
nr-DL-TDOA-ProvideAssistanceData-r16	Present if UE supports UE-assisted DL-TDOA. As defined in clause 8.4	Rel-16 onwards	

Table 9.3.3.1B.3.3-3: *ULInformationTransfer* (steps 0a and 3, Table 7.3.3.1B.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.3.1B.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.3.1B.3.3-4: UL NAS TRANSPORT (steps 0a and 3, Table 7.3.3.1B.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 0a:** Set according to Table 9.3.3.1B.3.3-6	LPP Provide Capabilities	
	Step 3: Set according to Table 9.3.3.1B.3.3-7	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.3.1B.3.2-1)	

Table 9.3.3.1B.3.3-5: LPP Request Location Information (step 2, Table 7.3.3.1B.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsRequired		
a-gnss-RequestLocationInformation	Present. As defined in Table 5.4-4		
gnss-Methods	GNSS-ID-Bitmap: bits 0, 3, 4, 5 = 1		
otdoa-RequestLocationInformation	Present. As defined in Table 5.4-5		
ecid-RequestLocationInformation	Present. As defined in Table 5.4-6		
requestedMeasurements	Test Configuration D: bits 0, 1, 2 = 1		
tbs-RequestLocationInformation-r13	Present. As defined in Table 5.4-7	Rel-13 onwards	
sensor-RequestLocationInformation-r13	Present. As defined in Table 5.4-10	Rel-13 onwards	
wlan-RequestLocationInformation-r13	Present. As defined in Table 5.4-8	Rel-13 onwards	
bt-RequestLocationInformation-r13	Present. As defined in Table 5.4-9	Rel-13 onwards	
nr-ECID-RequestLocationInformation-r16	Present. As defined in Table 8.4-4	Rel-16 onwards	
nr-Multi-RTT-RequestLocationInformation-r16	Present. As defined in Table 8.4-5	Rel-16 onwards	
nr-DL-AoD-RequestLocationInformation-r16	Present. As defined in Table 8.4-6	Rel-16 onwards	
nr-DL-TDOA-RequestLocationInformation-r16	Present. As defined in Table 8.4-7	Rel-16 onwards	

Table 9.3.3.1B.3.3-6: LPP Provide Capabilities (step 0a, Table 7.3.3.1B.3.2-1)

Derivation Path: Table 7.3.3.1B.3.3-6a			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.3.1B.3.3-6a with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-ECID-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.3.3.1B.3.3-7: LPP Provide Location Information (step 3, Table 7.3.3.1B.3.2-1)

Derivation Path: Table 7.3.3.1B.3.3-7			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.3.1B.3.3-7 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
nr-Multi-RTT-ProvideLocationInformation-r16 SEQUENCE {	Present if UE supports UE-assisted Multi-RTT.	Rel-16 onwards	
nr-Multi-RTT-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-Multi-RTT-Error-r16	May be present		
}			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {	Present if UE supports UE-assisted DL-AoD.	Rel-16 onwards	
nr-DL-AoD-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-AoD-LocationInformation-r16	Not present		
nr-DL-AoD-Error-r16	May be present		
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present if UE supports UE-assisted DL-TDOA.	Rel-16 onwards	
nr-DL-TDOA-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-tdoa-LocationInformation-r16	Not present		
nr-DL-TDOA-Error-r16	May be present		
}			
nr-ECID-ProvideLocationInformation-r16 SEQUENCE {	Present if UE supports UE-assisted NR E-CID.	Rel-16 onwards	
nr-ECID-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-ECID-Error-r16	May be present		
}			
}			
}			
}			
}			
}			
}			

9.3.4 LPP Positioning Procedures

9.3.4.1 E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Based

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.4.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
```

```
  when { UE receives assistance data and a location request for UE-based  }
    then { UE sends a PROVIDE LOCATION INFORMATION  message containing a location estimate }
           }
```

9.3.4.1.2 Conformance requirements

As defined in clause 7.3.4.1.2.

9.3.4.1.3 Test description

9.3.4.1.3.1 Pre-test conditions

System Simulator:

For Test Configuration B (Table 9.3.4.1.3.2-1):NR Cell 1.

- Satellite signals (sub-test case 15): as specified in 8.2.1.
- MBS signals (Sub-test 16): as specified in 8.2.4.
- WLAN signals (Sub-test 17): as specified in 8.2.5.
- Sub-test 20: NR Cell 1 and NR Cell 2, as specified in 8.2.10.
- Sub-test 21: NR Cell 1, NR Cell 2 and NR Cell 3, as specified in 8.2.11.

For Test Configuration D (Table 9.3.4.1.3.2-1): LTE Cell 1.

- Satellite signals (sub-test case 15): as specified in 8.2.1.
- MBS signals (Sub-test 16): as specified in 8.2.4.
- WLAN signals (Sub-test 17): as specified in 8.2.5.

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- For Test Configuration B (Table 9.3.4.1.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- For Test Configuration D (Table 9.3.4.1.3.2-1): FFS.

Related PICS/PIXIT Statements:

-

9.3.4.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.3.4.1.3.2-0 below:

Table 9.3.4.1.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 9.3.4.1.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.4.1
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour as defined in Table 7.3.4.1.3.2-1.

9.3.4.1.3.3 Specific message contents

As defined in clause 7.3.4.1.3.3, with the following exceptions:

Table 9.3.4.1.3.3-0 replaces Table 7.3.4.1.3.3-1, Table 9.3.4.1.3.3-1 replaces Table 7.3.4.1.3.3-2, Table 9.3.4.1.3.3-2 replaces Table 7.3.4.1.3.3-3, Table 9.3.4.1.3.3-2a replaces Table 7.3.4.1.3.3-4, Table 9.3.4.1.3.3-3 replaces Table 7.3.4.1.3.3-6, Table 9.3.4.1.3.3-4 replaces Table 7.3.4.1.3.3-7, Table 9.3.4.1.3.3-2b replaces Table 7.3.4.1.3.3-5, Table 9.3.4.1.3.3-5 replaces Table 7.3.4.1.3.3-7a and Table 9.3.4.1.3.3-6 replaces Table 7.3.4.1.3.3-8.

Table 9.3.4.1.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.1.3.2-1)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.1.3.3-1 with the following exceptions:			
UE Positioning Technology	Sub-test 20: 0 0 0 0 1 0 0 0 Sub-test 21: 0 0 0 0 0 1 1 1	Sub-test 20: DL-AoD Sub-test 21: DL-TDOA	

Table 9.3.4.1.3.3-1: *DLInformationTransfer* (steps 1a, 1c, 2, 3 and 4a, Table 7.3.4.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.1.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.1.3.3-2: DL NAS TRANSPORT (steps 1a, 1c, 2, 3 and 4a, Table 7.3.4.1.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1a:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 2: Set according to Table 9.3.4.1.3.3-2a	LPP Provide Assistance Data	
	Step 3: Set according to Table 9.3.4.1.3.3-2b	LPP Request Location Information	
	Steps 1c and 4a: Set according to Table 7.3.4.1.3.3-9	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.4.1.3.3-2a: LPP Provide Assistance data (step 2, Table 7.3.4.1.3.2-1)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

Table 9.3.4.1.3.3-2b: LPP Request Location Information (step 3, Table 7.3.4.1.3.2-1)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
locationInformationType	locationEstimateRequired		

Table 9.3.4.1.3.3-3: *ULInformationTransfer* (steps 1b and 4, Table 7.3.4.1.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.1.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.1.3.3-4: UL NAS TRANSPORT (steps 1b and 4, Table 7.3.4.1.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1b:** Set according to Table 9.3.4.1.3.3-5	LPP Provide Capabilities	
	Step 4: Set according to Table 9.3.4.1.3.3-6	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.4.1.3.2-1)	

Table 9.3.4.1.3.3-5: LPP Provide Capabilities. (step 1b, Table 7.3.4.1.3.2-1)

Derivation Path: Table 7.3.4.1.3.3-7a			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.1.3.3-7a with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.3.4.1.3.3-6: LPP Provide Location Information (step 4, Table 7.3.4.1.3.2-1)

Derivation Path: Table 7.3.4.1.3.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.1.3.3-8 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 20	Rel-16 onwards	
nr-DL-AoD-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-AoD-LocationInformation-r16	Present. Any value acceptable		
nr-DL-AoD-Error-r16	Not present		
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 21	Rel-16 onwards	
nr-DL-TDOA-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-tdoa-LocationInformation-r16	Present. Any value acceptable		
nr-DL-TDOA-Error-r16	Not present		
}			
}			
}			
}			

}			
}			
}			

9.3.4.2 E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.4.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives assistance data and a location request for UE-assisted  }
    then { UE sends a PROVIDE LOCATION INFORMATION  message containing location measurements }
            }
```

9.3.4.2.2 Conformance requirements

As defined in clause 7.3.4.2.2.

9.3.4.2.3 Test description

9.3.4.2.3.1 Pre-test conditions

System Simulator:

For Test Configuration B (Table 9.3.4.2.3.2-1):

- Sub-tests 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22: NR Cell 1.
- Sub-tests 5 and 7: NR Cell 1 and independent LTE Cell 1 and LTE Cell 2 as specified in 8.2.2.
- Sub-test 6: not applicable.
- Satellite signals (Sub-test 15): as specified in 8.2.1.
- WLAN signals (Sub-tests 11, 17): as specified in 8.2.5.
- MBS signals (Sub-tests 12, 16): as specified in 8.2.4
- Bluetooth signals (Sub-test 13): as specified in 8.2.6.
- Sub-test 21: NR Cell 1 and NR Cell 2, as specified in 8.2.11.

For Test Configuration D (Table 9.3.4.2.3.2-1):

- Sub-tests 11, 12, 13, 14, 15, 16, 17, 18: LTE Cell 1.
- Sub-tests 5 and 7: LTE Cell 1 and LTE Cell 2, as specified in 8.2.2.
- Sub-test 6: LTE Cell 1 and LTE Cell 2, as specified in 8.2.3.
- Satellite signals (Sub-test 15): as specified in 8.2.1.
- WLAN signals (Sub-tests 11, 17): as specified in 8.2.5.
- MBS signals (Sub-tests 12, 16): as specified in 8.2.4

- Bluetooth signals (Sub-test 13): as specified in 8.2.6.

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- For Test Configuration B (Table 9.3.4.2.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
  - Sub-test 5 and 7: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.2.3.1-1 for the configuration of measurement gaps for OTDOA (LTE).
  - Sub-test 19: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.2.3.1-1 for the configuration of measurement gaps for Multi-RTT and then the SS shall execute the steps in Table 9.3.4.2.3.1-2 for the configuration of UL-SRS for Multi-RTT.
  - Sub-test 20: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.2.3.1-1 for the configuration of measurement gaps for DL-AoD.
  - Sub-test 21 After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.2.3.1-1 for the configuration of measurement gaps for DL-TDOA.

Table 9.3.4.2.3.1-1: Configuration of measurement gaps

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.1-1.	<--	RRCReconfiguration	-	-
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

Table 9.3.4.2.3.1-2: Configuration of UL-SRS for Multi-RTT

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.2-1.	<--	RRCReconfiguration	-	-
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

- For Test Configuration D (Table 9.3.4.2.3.2-1): FFS.

Related PICS/PIXIT Statements:

-

9.3.4.2.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.3.4.2.3.2-0 below:

Table 9.3.4.2.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
5	UE supporting OTDOA (LTE) (Rel-15 onwards)
6	UE supporting ECID (LTE) (Test Configuration D only)
7	UE supporting GNSS(1) and OTDOA (LTE) (Rel-15 onwards)
11	UE supporting WLAN (Rel-13 only)
12	UE supporting MBS (Rel-13 only)
13	UE supporting Bluetooth
14	UE supporting Sensor (Rel-13 only)
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
19	UE supporting Multi-RTT (Rel-16 onwards)
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
22	UE supporting NR E-CID (Rel-16 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 9.3.4.2.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.4.2
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour as defined in clause 7.3.4.2.3.2.

For sub-test 19 or sub-test 20 or sub-test 21, the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE at step 1. Then the stored assistance data in the UE are cleared.

For sub-test 22 NR E-CID, the SS does not send LPP message of type Provide Assistance Data at step 2.

9.3.4.2.3.3 Specific message contents

As defined in clause 7.3.4.2.3.3, with the following exceptions:

Table 9.3.4.2.3.3-0 replaces Table 7.3.4.2.3.3-1, Table 9.3.4.2.3.3-1 replaces Table 7.3.4.2.3.3-3, Table 9.3.4.2.3.3-2 replaces Table 7.3.4.2.3.3-4, Table 9.3.4.2.3.3-2a replaces Table 7.3.4.2.3.3-5, Table 9.3.4.2.3.3-3 replaces Table 7.3.4.2.3.3-7, Table 9.3.4.2.3.3-4 replaces Table 7.3.4.2.3.3-8, Table 9.3.4.2.3.3-5 replaces Table 7.3.4.2.3.3-6, Table 9.3.4.2.3.3-6 replaces Table 7.3.4.2.3.3-8a and Table 9.3.4.2.3.3-7 replaces Table 7.3.4.2.3.3-9.

Table 9.3.4.2.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.2.3.2-1)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.2.3.3-1 with the following exceptions:			
UE Positioning Technology	Sub-test 19: 0 0 0 0 0 1 1 0 Sub-test 20: 0 0 0 0 1 0 0 0 Sub-test 21: 0 0 0 0 0 1 1 1	Sub-test 19: Multi-RTT Sub-test 20: DL-AoD Sub-test 21: DL-TDOA	

Table 9.3.4.2.3.3-1: *DLInformationTransfer* (steps 1b, 1d, 2, 3, 4a2, 4b2 and 4b4, Table 7.3.4.2.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.2.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.2.3.3-2: DL NAS TRANSPORT (steps 1b, 1d, 2, 3, 4a2, 4b2 and 4b4, Table 7.3.4.2.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1b:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 2: Set according to Table 9.3.4.2.3.3-2a	LPP Provide Assistance Data	
	Step 3: Set according to Table9.3.4.2.3.3-5	LPP Request Location Information	
	Steps 1d, 4a2, 4b2 and 4b4: Set according to Table 7.3.4.2.3.3-10	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.4.2.3.3-2a: LPP Provide Assistance data (step 2, Table 7.3.4.2.3.2-1)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

Table 9.3.4.2.3.3-3: *ULInformationTransfer* (steps 1c, 4 a1, 4b1 and 4b3, Table 7.3.4.2.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.2.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.2.3.3-4: UL NAS TRANSPORT (steps 1c, 4 a1, 4b1 and 4b3, Table 7.3.4.2.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1c:** Set according to Table 9.3.4.2.3.3-6	LPP Provide Capabilities	
	Steps 4 a1, 4b1 and 4b3: Set according to Table 9.3.4.2.3.3-7	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.4.2.3.2-1)	

Table 9.3.4.2.3.3-5: LPP Request Location Information (step 3, Table 7.3.4.2.3.2-1)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestLocationInformation-r9 SEQUENCE {			
commonIEsRequestLocationInformation SEQUENCE {			
locationInformationType	locationMeasurementsRequired		
}			
ecid-RequestLocationInformation SEQUENCE {			
requestedMeasurements	Test Configuration D: bits 0, 1, 2 = 1		
}			
}			
}			
}			
}			
}			
}			

Table 9.3.4.2.3.3-6: LPP Provide Capabilities. (step 1c, Table 7.3.4.2.3.2-1)

Derivation Path: Table 7.3.4.2.3.3-8a			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.2.3.3-8a with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.3.4.2.3.3-7: LPP Provide Location Information (steps 4 a1, 4b1 and 4b3, Table 7.3.4.2.3.2-1)

Derivation Path: Table 7.3.4.2.3.3-9			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.2.3.3-9 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
nr-ECID-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 22. Not present for sub-tests 19, 20 and 21(Note1).	Rel-16 onwards	
nr-ECID-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-ECID-Error-r16	May be present		
}			
nr-Multi-RTT-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 19. Not present for sub-tests 20, 21 and 22(Note1).	Rel-16 onwards	
nr-Multi-RTT-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-Multi-RTT-Error-r16	May be present		
}			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 20. Not present for sub-tests 19, 21 and 22(Note1).	Rel-16 onwards	
nr-DL-AoD-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-DL-AoD-Error-r16	May be present		
nr-dl-AoD-LocationInformation-r16	Not present		
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 21. Not present for sub-tests 19, 20 and 22(Note1).	Rel-16 onwards	
nr-DL-TDOA-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-tdoa-LocationInformation-r16	Not present		
nr-DL-TDOA-Error-r16	May be present		
}			
}			
}			
}			
}			
}			
}			
Note 1: In addition, a-gnss-ProvideLocationInformation, otdoa-ProvideLocationInformation, ecid-ProvideLocationInformation, sensor-ProvideLocationInformation-r13, tbs-ProvideLocationInformation-r13, wlan-ProvideLocationInformation-r13 and bt-ProvideLocationInformation-r13 shall also be not present.			

9.3.4.3 E-SMLC Initiated Position Measurement without assistance data: UE-Based

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.4.3.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE has no assistance data stored and receives a location request for UE-based and the UE
         requires assistance data in order to fulfil the location request }
    then {    UE sends a REQUEST ASSISTANCE DATA message followed by a PROVIDE LOCATION INFORMATION
         message containing a location estimate }
           }
```

9.3.4.3.2 Conformance requirements

As defined in clause 7.3.4.3.2.

9.3.4.3.3 Test description

9.3.4.3.3.1 Pre-test conditions

System Simulator:

For Test Configuration B (Table 9.3.4.3.3.2-1): NR Cell 1.

- Satellite signals (sub-test 15): as specified in 8.2.1.
- MBS signals (sub-test 16): as specified in 8.2.4.
- WLAN signals (sub-test 17): as specified in 8.2.5.
- Sub-test 20: NR Cell 1 and NR Cell 2, as specified in 8.2.10.
- Sub-test 21: NR Cell 1, NR Cell 2 and NR Cell 3, as specified in 8.2.11.

For Test Configuration D (Table 9.3.4.3.3.2-1): LTE Cell 1.

- Satellite signals (sub-test 15): as specified in 8.2.1.
- MBS signals (sub-test 16): as specified in 8.2.4.
- WLAN signals (sub-test 17): as specified in 8.2.5.

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- For Test Configuration B (Table 9.3.4.3.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- For Test Configuration D (Table 9.3.4.3.3.2-1): FFS.

Related PICS/PIXIT Statements:

Method of triggering an LPP Request Assistance Data message.

9.3.4.3.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.3.4.3.3.2-0 below:

Table 9.3.4.3.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 9.3.4.3.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.4.3
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour as defined in Table 7.3.4.3.3.2-1.

9.3.4.3.3.3 Specific message contents

As defined in clause 7.3.4.3.3.3, with the following exceptions:

Table 9.3.4.3.3.3-0 replaces Table 7.3.4.3.3.3-1, Table 9.3.4.3.3.3-1 replaces Table 7.3.4.3.3.3-2, Table 9.3.4.3.3.3-2 replaces Table 7.3.4.3.3.3-3, Table 9.3.4.3.3.3-2a replaces Table 7.3.4.3.3.3-9, Table 9.3.4.3.3.3-3 replaces Table 7.3.4.3.3.3-6, Table 9.3.4.3.3.3-4 replaces Table 7.3.4.3.3.3-7, Table 9.3.4.3.3.3-5 replaces Table 7.3.4.3.3.3-7a, Table 9.3.4.3.3.3-6 replaces Table 7.3.4.3.3.3-8 and Table 9.3.4.3.3.3-7 replaces Table 7.3.4.3.3.3-10.

Table 9.3.4.3.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.3.3.2-1)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.3.3.3-1 with the following exceptions:			
UE Positioning Technology	Sub-test 20: 0 0 0 0 1 0 0 0 Sub-test 21: 0 0 0 0 0 1 1 1	Sub-test 20: DL-AoD Sub-test 21: DL-TDOA	

Table 9.3.4.3.3.3-1: *DLInformationTransfer* (steps 1a, 1c, 2, 4 and 5a, Table 7.3.4.3.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.3.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.3.3.3-2: DL NAS TRANSPORT (steps 1a, 1c, 2, 4 and 5a, Table 7.3.4.3.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1a:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 2: Set according to Table 9.3.4.3.3.3-2b	LPP Request Location Information	
	Step 4: Set according to Table 9.3.4.3.3.3-2a	LPP Provide Assistance Data	
	Steps 1c and 5a: Set according to Table 7.3.4.3.3.3-11	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.4.3.3.3-2a: LPP Provide Assistance Data (step 4, Table 7.3.4.3.3.2-1)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Assistance Data message in step 3 Table 7.3.4.3.3.2-1	
}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {	Present if acknowledgement field is included by the UE at step 3, Table 7.3.4.3.3.2-1.		
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value as the sequenceNumber in step 3, Table 7.3.4.3.3.2-1	
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			

a-gnss-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to TS 37.571-5 [12].		
sensor-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 8.4.1.5.	Rel-14 onwards	
tbs-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 8.4.1.3.	Rel-14 onwards	
wlan-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 8.4.1.4.	Rel-14 onwards	
nr-DL-AoD-ProvideAssistanceData-r16	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 8.4.1.7.	Rel-16 onwards	
nr-DL-TDOA-ProvideAssistanceData-r16	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.3.3.2-1 which are available according to subclause 8.4.1.8.	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.3.4.3.3.3-2b: LPP Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 5.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 5.4-3 with the following exceptions:			
locationInformationType	locationEstimateRequired		
a-gnss-RequestLocationInformation	Set according to Table 7.3.4.3.3.3-5		Sub-test 15
sensor-RequestLocationInformation-r14	Set according to Table 7.3.4.3.3.3-5B	Rel-14 onwards	Sub-test 18
tbs-RequestLocationInformation-r13	Set according to Table 7.3.4.3.3.3-5A	Rel-13 onwards	Sub-test 16
wlan-RequestLocationInformation-r14	Set according to Table 7.3.4.3.3.3-5C	Rel-14 onwards	Sub-test 17
nr-DL-AoD-RequestLocationInformation-r16	As defined in Table 9.3.4.3.3.3-2c	Rel-16 onwards	Sub-test 20
nr-DL-TDOA-RequestLocationInformation-r16	As defined in Table 9.3.4.3.3.3-2d	Rel-16 onwards	Sub-test 21

Table 9.3.4.3.3.3-2c: NR DL-AoD Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 8.4-6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-6 with the following exceptions:			
nr-AssistanceAvailability-r16	TRUE		

Table 9.3.4.3.3.3-2d: NR DL-TDOA Request Location Information (step 2, Table 7.3.4.3.3.2-1)

Derivation Path: Table 8.4-7			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-7 with the following exceptions:			
nr-AssistanceAvailability-r16	TRUE		

Table 9.3.4.3.3.3-3: *ULInformationTransfer* (steps 1b, 3 and 5, Table 7.3.4.3.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.3.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.3.3.3-4: UL NAS TRANSPORT (steps 1b, 3 and 5, Table 7.3.4.3.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1b:** Set according to Table 9.3.4.3.3.3-5	LPP Provide Capabilities	
	Step 3: Set according to Table 9.3.4.3.3.3-6	LPP Request Assistance Data	
	Step 5: Set according to Table 9.3.4.3.3.3-7	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.4.3.3.2-1)	

Table 9.3.4.3.3.3-5: LPP Provide Capabilities. (step 1b, Table 7.3.4.3.3.2-1)

Derivation Path: Table 7.3.4.3.3.3-7a			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.3.3.3-7a with the following exceptions:			
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1a, Table 7.3.4.3.3.2-1	
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-DL-AoD-RequestCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-RequestCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			

Table 9.3.4.3.3.3-6: LPP Request Assistance Data (step 3, Table 7.3.4.3.3.2-1)

Derivation Path: Table 7.3.4.3.3.3-8			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.3.3.3-8 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestAssistanceData-r9 SEQUENCE {			
nr-DL-AoD-RequestAssistanceData-r16	Present for sub-test 20	Rel-16 onwards	
nr-DL-TDOA-RequestAssistanceData-r16	Present for sub-test 21	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.3.4.3.3.3-7: LPP Provide Location Information (step 5, Table 7.3.4.3.3.2-1)

Derivation Path: Table 7.3.4.3.3.3-10			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.3.3.3-10 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
nr-DL-AoD-ProvideLocationInformation-r16	Present for sub-test 20	Rel-16 onwards	
nr-DL-TDOA-ProvideLocationInformation-r16	Present for sub-test 21	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

9.3.4.4 E-SMLC Initiated Position Measurement without assistance data: UE-Assisted

Editor's note: Test configuration D is incomplete:

- The corresponding attach procedure for NG-RAN E-UTRA has not yet been defined.
- The message contents need to be revised for Test Configuration D.

9.3.4.4.1 Test Purpose (TP)

```
with { a NAS signalling connection existing }
ensure that {
  when {    UE has no assistance data stored and receives a location request for UE-assisted and the
            UE requires assistance data in order to fulfil the location request }
    then {  UE sends a REQUEST ASSISTANCE DATA message followed by a PROVIDE LOCATION INFORMATION
            message containing location measurements }
            }
```

9.3.4.4.2 Conformance requirements

As defined in clause 7.3.4.4.2.

9.3.4.4.3 Test description

9.3.4.4.3.1 Pre-test conditions

System Simulator:

For Test Configuration B (Table 9.3.4.4.3.2-1):

- Sub-tests 15, 16, 17, 18, 19, 20: NR Cell 1.
- Sub-tests 5 and 7: NR Cell 1 and independent LTE Cell 1 and LTE Cell 2 as specified in 8.2.2.
- Satellite signals (sub-test 15): as specified in 8.2.1.
- MBS signals (sub-test 16): as specified in 8.2.4.
- WLAN signals (sub-test 17): as specified in 8.2.5.

- Sub-test 21: NR Cell 1 and NR Cell 2, as specified in 8.2.11.

For Test Configuration D (Table 9.3.4.4.3.2-1):

- Sub-tests 15, 16, 17, 18: LTE Cell 1.
- Sub-tests 5 and 7: LTE Cell 1 and LTE Cell 2, as specified in 8.2.2.
- Satellite signals (sub-test 15): as specified in 8.2.1.
- MBS signals (sub-test 16): as specified in 8.2.4.
- WLAN signals (sub-test 17): as specified in 8.2.5.

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- For Test Configuration B (Table 9.3.4.4.3.2-1): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
  - Sub-test 5 and 7: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.4.3.1-1 for the configuration of measurement gaps for OTDOA (LTE).
  - Sub-test 19: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.4.3.1-1 for the configuration of measurement gaps for Muti-RTT and then the SS shall execute the steps in Table 9.3.4.4.3.1-2 for the configuration of UL-SRS for Muti-RTT.
  - Sub-test 20: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.4.3.1-1 for the configuration of measurement gaps for DL-AoD.
  - Sub-test 21: After the UE is in state 3N-A, the SS shall execute the steps in Table 9.3.4.4.3.1-1 for the configuration of measurement gaps for DL-TDOA.

Table 9.3.4.4.3.1-1: Configuration of measurement gaps

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.1-1.	<--	RRCReconfiguration	-	-
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

Table 9.3.4.4.3.1-2: Configuration of UL-SRS for Multi-RTT

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an RRCReconfiguration message as in Table 8.3.2-1.	<--	RRCReconfiguration	-	-
2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-

- For Test Configuration D (Table 9.3.4.4.3.2-1): FFS.

Related PICS/PIXIT Statements:

Method of triggering an LPP Request Assistance Data message.

9.3.4.4.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.3.4.4.3.2-0 below:

Table 9.3.4.4.3.2-0: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
5	UE supporting OTDOA (LTE) (Rel-15 onwards)
7	UE supporting GNSS(1) and OTDOA (LTE) (Rel-15 onwards)
15	UE supporting GNSS(1)
16	UE supporting MBS (Rel-14 onwards)
17	UE supporting WLAN (Rel-14 onwards)
18	UE supporting Sensor (Rel-14 onwards)
19	UE supporting Multi-RTT (Rel-16 onwards)
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 9.3.4.4.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
A	EN-DC	Functionality is tested by test case 7.3.4.4
B	NG-RAN NR	
C	NE-DC	Functionality is tested by test configuration B
D	NG-RAN E-UTRA	
E	NGEN-DC	Functionality is tested by test configuration D

Main behaviour as defined in Table 7.3.4.4.3.2-1.

For sub-test 19 or sub-test 20 or sub-test 21, the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE at step 1. Then the stored assistance data in the UE are cleared.

9.3.4.4.3.3 Specific message contents

As defined in clause 7.3.4.4.3.3, with the following exceptions:

Table 9.3.4.4.3.3-0 replaces Table 7.3.4.4.3.3-1, Table 9.3.4.4.3.3-1 replaces Table 7.3.4.4.3.3-3, Table 9.3.4.4.3.3-2 replaces Table 7.3.4.4.3.3-4,Table 9.3.4.4.3.3-2a replaces Table 7.3.4.4.3.3-10, Table 9.3.4.4.3.3-3 replaces Table 7.3.4.4.3.3-7, Table 9.3.4.4.3.3-4 replaces Table 7.3.4.4.3.3-8, Table 9.3.4.4.3.3-2b replaces Table 7.3.4.4.3.3-5, Table 9.3.4.4.3.3-5 replaces Table 7.3.4.4.3.3-8a, Table 9.3.4.4.3.3-6 replaces Table 7.3.4.4.3.3-9 and Table 9.3.4.4.3.3-7 replaces Table 7.3.4.4.3.3-11.

Table 9.3.4.4.3.3-0: RESET UE POSITIONING STORED INFORMATION (step 1, Table 7.3.4.4.3.2-1)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.4.3.3-1 with the following exceptions:			
UE Positioning Technology	Sub-test 19: 0 0 0 0 0 1 1 0 Sub-test 20: 0 0 0 0 1 0 0 0 Sub-test 21: 0 0 0 0 0 1 1 1	Sub-test 19: Multi-RTT Sub-test 20: DL-AoD Sub-test 21: DL-TDOA	

Table 9.3.4.4.3.3-1: *DLInformationTransfer* (steps 1b, 1d, 2, 4, 4b, 5a2, 5b2 and 5b4, Table 7.3.4.4.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.4.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.4.3.3-2: DL NAS TRANSPORT (steps 1b, 1d, 2, 4, 4b, 5a2, 5b2 and 5b4, Table 7.3.4.4.3.2-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1b:** Set according to Table 8.4-2	LPP Request Capabilities	
	Step 2: Set according to Table 9.3.4.4.3.3-2b	LPP Request Location Information	
	Steps 4 and 4b: Set according to Table 9.3.4.4.3.3-2a	LPP Provide Assistance Data	
	Steps 1d, 5a2, 5b2 and 5b4: Set according to Table 7.3.4.4.3.3-12	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.4.4.3.3-2a: LPP Provide Assistance Data (steps 4 and 4b, Table 7.3.4.4.3.2-1)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Assistance Data message in step 3 or 4a Table 7.3.4.4.3.2-1.	

}			
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {	Present if acknowledgement field is included by the UE at step 3 or 4a, Table 7.3.4.4.3.2-1.		
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value as the sequenceNumber in step 3 or 4a, Table 7.3.4.4.3.2-1.	
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
a-gnss-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 3 or 4a, Table 7.3.4.4.3.2-1 which are available according to TS 37.571-5 [12].	For sub-test 7, in case the UE sends two separate LPP Request Assistance Data messages in steps 3 and 4a then the SS sends two seperate LPP Provide Assistance Data messages in steps 4 and 4b each containing the relevant assistance data.	Sub-tests 7, 15
otdoa-ProvideAssistanceData	The SS provides the assistance data requested by the UE at step 3 or 4a, Table 7.3.4.4.3.2-1 according to subclause 8.4.1.2.	For sub-test 7, in case the UE sends two separate LPP Request Assistance Data messages in steps 3 and 4a then the SS sends two seperate LPP Provide Assistance Data messages in steps 4 and 4b each containing the relevant assistance data.	Sub-tests 5,7

sensor-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 8.4.1.5.	Release 14 onwards	Sub-test 18
tbs-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 8.4.1.3.	Release 14 onwards	Sub-test 16
wlan-ProvideAssistanceData-r14	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 8.4.1.4.	Release 14 onwards	Sub-test 17
nr-Multi-RTT-ProvideAssistanceData-r16	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 8.4.1.6.	Release 16 onwards	Sub-test 19
nr-DL-AoD-ProvideAssistanceData-r16	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 8.4.1.7.	Release 16 onwards	Sub-test 20
nr-DL-TDOA-ProvideAssistanceData-r16	The SS provides the assistance data requested by the UE at step 3, Table 7.3.4.4.3.2-1 which are available according to subclause 8.4.1.8.	Release 16 onwards	Sub-test 21
}			
}			
}			
}			
}			
}			

Table 9.3.4.4.3.3-2b: LPP Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 7.3.4.4.3.3-5			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.4.3.3-5 with the following exceptions:			
nr-Multi-RTT-RequestLocationInformation-r16	As defined in Table 9.3.4.4.3.3-2c	Rel-16 onwards	Sub-test 19
nr-DL-AoD-RequestLocationInformation-r16	As defined in Table 9.3.4.4.3.3-2d	Rel-16 onwards	Sub-test 20
nr-DL-TDOA-RequestLocationInformation-r16	As defined in Table 9.3.4.4.3.3-2e	Rel-16 onwards	Sub-test 21

Table 9.3.4.4.3.3-2c: NR Multi-RTT Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 8.4-5			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-5 with the following exceptions:			
nr-AssistanceAvailability-r16	TRUE		

Table 9.3.4.4.3.3-2d: NR DL-AoD Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 8.4-6			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-6 with the following exceptions:			
nr-AssistanceAvailability-r16	TRUE		

Table 9.3.4.4.3.3-2e: NR DL-TDOA Request Location Information (step 2, Table 7.3.4.4.3.2-1)

Derivation Path: Table 8.4-7			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-7 with the following exceptions:			
nr-AssistanceAvailability-r16	TRUE		

Table 9.3.4.4.3.3-3: *ULInformationTransfer* (steps 1c, 3, 4a, 5a1, 5b1 and 5b3, Table 7.3.4.4.3.2-1)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.4.3.3-4	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.4.3.3-4: UL NAS TRANSPORT (steps 1c, 3, 4a, 5a1, 5b1 and 5b3, Table 7.3.4.4.3.2-1)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1c:** Set according to Table 9.3.4.4.3.3-5	LPP Provide Capabilities	
	Steps 3 and 4a: Set according to Table 9.3.4.4.3.3-6	LPP Request Assistance Data	
	Steps 5a1, 5b1 and 5b3: Set according to Table 9.3.4.4.3.3-7	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 7.3.4.4.3.2-1)	

Table 9.3.4.4.3.3-5: LPP Provide Capabilities. (step 1c, Table 7.3.4.4.3.2-1)

Derivation Path: Table 7.3.4.4.3.3-8a			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.4.3.3-8a with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
otdoa-ProvideCapabilities	Present or not present dependent on pc_OTDOA_onNR		
ecid-ProvideCapabilities	Present or not present dependent on pc_ECID_onNR		
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.3.4.4.3.3-6: LPP Request Assistance Data (steps 3 and 4a, Table 7.3.4.4.3.2-1)

Derivation Path: Table 7.3.4.4.3.3-9			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.4.3.3-9 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestAssistanceData-r9 SEQUENCE {			
nr-Multi-RTT-RequestAssistanceData-r16	Present for sub-test 19	Rel-16 onwards	
nr-DL-AoD-RequestAssistanceData-r16	Present for sub-test 20	Rel-16 onwards	
nr-DL-TDOA-RequestAssistanceData-r16	Present for sub-test 21	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.3.4.4.3.3-7: LPP Provide Location Information (steps 5a1, 5b1 and 5b3, Table 7.3.4.4.3.2-1)

Derivation Path: Table 7.3.4.4.3.3-11			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 7.3.4.4.3.3-11 with the following exceptions:			

LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
nr-Multi-RTT-ProvideLocationInformation-r16	Present for sub-test 19	Rel-16 onwards	
nr-DL-AoD-ProvideLocationInformation-r16	Present for sub-test 20	Rel-16 onwards	
nr-DL-TDOA-ProvideLocationInformation-r16	Present for sub-test 21	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

9.3.4.5 LPP carrier phase positioning procedure

9.3.4.5.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives assistance data and a LPP REQUEST LOCATION INFORMATION message indicating the
UE to provide DL carrier phase measurement}
    then { UE sends a PROVIDE LOCATION INFORMATION message containing DL RSCPD/RSCP measurements
together with the DL RSTD/UE Rx–Tx time difference measurements }
}
```

9.3.4.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.214 clause 5.1.6.5.2, TS 38.305 clauses 8.10 and clause 8.12. Unless otherwise stated these are Rel-18 requirements.

[TS 38.214, clause 5.1.6.5.2]

For DL UE positioning measurement reporting in higher layer parameter *NR-DL-TDOA-SignalMeasurementInformation*, the UE may be configured to report the DL Reference Signal Carrier Phase Difference (RSCPD) [7, TS 38.215] measurement along with the DL RSTD measurement. When the UE reports RSCPD measurements, the reference *nr-DL-PRS-ReferenceInfo* is the same as the one reported, for the RSTD measurements. For DL UE positioning measurement reporting in higher layer parameter *NR-Multi-RTT-SignalMeasurementInformation*, the UE may be configured to report the DL Reference Signal Carrier Phase (RSCP) measurement [7, TS 38,215] along with the UE Rx-Tx time difference measurement. When the UE reports DL RSCPD measurement(s) along with DL RSTD measurement(s) or DL RSCP measurement(s) along with UE Rx-Tx time difference measurement(s), the DL RSCPD and/or DL RSCP measurement(s) should be measured from a single DL PRS positioning frequency layer. For a UE in RRC_CONNECTED state, DL RSCP/RSCPD measurements are measured within the configured measurement gap.

The UE is expected to obtain each DL RSCP or DL RSCPD measurement with $N_{sample} = 1$ as defined in [11, TS 38.133]. If the UE reports a DL RSTD measurement with N_{sample} = 2 or 4 samples as defined in [11, TS 38.133], up to N_{sample} DL RSCPD measurements can be reported associated with the DL RSTD measurement. If the UE reports a UE Rx-Tx time difference measurement with N_{sample} = 2 or 4 samples as defined in [11, TS 38.133], up to N_{sample} DL RSCP measurements can be reported associated with the UE Rx-Tx time difference measurement. Each DL RSCP or DL RSCPD measurement has its own timestamp.

[TS 38.305, clause 8.10]

In the Multi-RTT positioning method, the UE position is estimated based on measurements performed at both, UE and TRPs. The measurements performed at the UE and TRPs are UE/gNB Rx-Tx time difference measurements (and optionally DL-PRS-RSRP, DL-PRS-RSRPP, UL-SRS-RSRP, UL-SRS-RSRPP, and/or DL-RSCP/UL-RSCP) of DL-PRS and UL-SRS, which are used by an LMF to determine the RTTs.

…

The information that may be signalled from UE to the LMF is listed in Table 8.10.2.2-1. The individual UE measurements are defined in TS 38.215 [37].

Table 8.10.2.2-1: Measurement results that may be transferred from UE to the LMF

Information
PCI, GCI, and PRS ID, ARFCN, PRS resource ID, PRS resource set ID for each measurement
DL-PRS-RSRP measurement
UE Rx-Tx time difference measurement
DL-RSCP measurement[NOTE1, NOTE2]
Time stamp of the measurement
Quality for each measurement
TA offset used by UE
UE Rx TEG IDs, UE Tx TEG IDs, and UE RxTx TEG IDs associated with UE Rx-Tx time difference measurements
LOS/NLOS information for UE measurements
DL-PRS-RSRPP measurement
The association of UE Tx TEG ID and SRS
Indication that DL-PRS bandwidth aggregation has been used for UE Rx-Tx time difference measurement
Indication that the reported measurements are based on receiving single or multiple hops of DL-PRS
UE Rx – Tx time difference subframe offset
DL timing drift
NOTE 1: The DL-RSCP measurement may be reported along with the UE Rx-Tx time difference measurement. NOTE 2: The DL-RSCP is measured from a single DL PRS positioning frequency layer.

[TS 38.305, clause 8.12]

In the DL-TDOA positioning method, the UE position is estimated based on DL RSTD (and optionally DL-PRS-RSRP and/or DL-PRS-RSRPP and/or DL-RSCPD) measurements taken at the UE of downlink radio signals from multiple NR TRPs, along with knowledge of the geographical coordinates of the TRPs and their relative downlink timing.

The UE while connected to a gNB may require measurement gaps to perform the DL-TDOA measurements from NR TRPs. The UE may request measurement gaps from a gNB using the procedure described in clause 7.4.1.1. The UE may also request to activate pre-configured measurement gaps as described in clause 7.7.2.

The specific positioning techniques used to estimate the UE's location from this information are beyond the scope of this specification.

…

The information that may be signalled from UE to the LMF is listed in Table 8.12.2.2.0-1. The individual UE measurements are defined in TS 38.215 [37].

Table 8.12.2.2.0-1: Measurement results that may be transferred from UE to the LMF

Information	UE-assisted	UE-based
Latitude/Longitude/Altitude, together with uncertainty shape	No	Yes
PCI, GCI, ARFCN, PRS resource ID, PRS resource set ID and PRS ID for each measurement	Yes	No
DL RSTD measurement	Yes	No
DL-PRS-RSRP measurement	Yes	No
DL-RSCPD measurement[NOTE 1, NOTE 2]	Yes	No
Time stamp of the measurements	Yes	No
Time stamp of location estimate	No	Yes
Quality for each measurement	Yes	No
UE Rx TEG IDs for DL RSTD measurements	Yes	No
DL-PRS-RSRPP measurement	Yes	No
LOS/NLOS information for UE measurements	Yes	No
Indication that DL-PRS bandwidth aggregation has been used for DL RSTD measurement	Yes	No
Indication that the reported measurements are based on receiving single or multiple hops of DL-PRS.	Yes	No
Protection Level, optionally together with achievable Target Integrity Risk	No	Yes
NOTE 1: The DL-RSCPD measurement may be reported along with the DL RSTD measurement. NOTE 2: The DL-RSCPD is measured from a single DL PRS positioning frequency layer.		

9.3.4.5.3 Test description

9.3.4.5.3.1 Pre-test conditions

System Simulator:

- Sub-test 30: NR Cell 1 as specified in 8.2.9 and system information combination NR-1 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.
- Sub-test 32: NR Cell 1, NR Cell 2 and NR Cell 3 as specified in 8.2.11 and system information combination NR-4 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- Then the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE to clear the stored assistance data in the UE.

Related PICS/PIXIT Statements:

-

9.3.4.5.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.3.4.5.3.2-1 below:

Table 9.3.4.5.3.2-1: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
30	UE supporting Multi-RTT (Rel-18 onwards)
32	UE supporting DL-TDOA (Rel-18 onwards)

Table 9.3.4.5.3.2-2: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
B	NG-RAN NR	

Table 9.3.4.5.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends an LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
3	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4	The SS sends an LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
5	The SS sends an RRCReconfiguration message.	<--	RRCReconfiguration		
6	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete		
7	The SS sends an LPP message of type Request Location Information including a request for location estimate and location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
8	Check: Does the UE send an LPP message of type Provide Location Information including DL RSCPD/RSCP measurements together with the DL RSTD/UE Rx–Tx time difference measurements?	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
9	IF the UE LPP message at step 8 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

9.3.4.5.3.3 Specific message contents

Table 9.3.4.5.3.3-1: RESET UE POSITIONING STORED INFORMATION (Preamble)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 30: 0 0 0 0 0 1 1 0 Sub-test 32: 0 0 0 0 0 1 1 1	Sub-test 30: Multi-RTT Sub-test 32: DL-TDOA	

Table 9.3.4.5.3.3-2: DLInformationTransfer (step 1, step 3, step 4, step 7 and step 9, Table 9.3.4.5.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.5.3.3-3	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.5.3.3-3: DL NAS TRANSPORT (DLInformationTransfer, Table 9.3.4.5.3.3-2)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Steps 3 and 9: Set according to Table 9.3.4.5.3.3-4	LPP Acknowledgement	
	Step 4: Set according to Table 9.3.4.5.3.3-5	LPP Provide Assistance Data	
	Step 7: Set according to Table 9.3.4.5.3.3-6	LPP Request Location Information	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.4.5.3.3-4: LPP Acknowledgement (DLInformationTransfer, Table 9.3.4.5.3.3-2)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the	

		sequenceNumber field in steps 2 or 8, Table 9.3.4.5.3.2-3	
}			
lpp-MessageBody	Not present.		
}			

Table 9.3.4.5.3.3-5: LPP Provide Assistance data (DLInformationTransfer, Table 9.3.4.5.3.3-2)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

Table 9.3.4.5.3.3-6: LPP Request Location Information (DLInformationTransfer, Table 9.3.4.5.3.3-2)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestLocationInformation-r9 SEQUENCE {			
commonIEsRequestLocationInformation SEQUENCE {			
locationInformationType	locationMeasurementsPreferred		
}			
nr-Multi-RTT-RequestLocationInformation-r16 SEQUENCE {			Sub-test 30
nr-RequestedMeasurements-r16	bit 2 = 1 (dl-PRS-RSCP-Request-r18)		
}			
nr-DL-TDOA-RequestLocationInformation-r16 SEQUENCE {			Sub-test 32
nr-RequestedMeasurements-r16	bit 2 = 1 (dl-PRS-RSCPD-Request-r18)		
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.3.4.5.3.3-7: RRCReconfiguration (step 5, Table 9.3.4.5.3.2-3)

Derivation Path: TS 38.508-1, table 4.6.1-3			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
radioBearerConfig			
measConfig	MeasConfig as defined in Table 8.3.1-2		
lateNonCriticalExtension	Not present		
nonCriticalExtension SEQUENCE {			Sub-test 30
masterCellGroup	CellGroupConfig as defined in Table 8.3.2-2		
}			
}			
}			
}			

Table 9.3.4.5.3.3-8: ULInformationTransfer (step 2 and step 10, Table 9.3.4.5.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.5.3.3-9	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.5.3.3-9: UL NAS TRANSPORT (ULInformationTransfer, Table 9.3.4.5.3.3-8)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 2:** Set according to Table 9.3.4.5.3.3-10	LPP Provide Capabilities	
	Step 10: Set according to Table 9.3.4.5.3.3-11	LPP Provide Location Information	

Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 9.3.4.5.3.2-3)	

Table 9.3.4.5.3.3-10: LPP Provide Capabilities (ULInformationTransfer, Table 9.3.4.5.3.3-8)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 9.3.4.5.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities		
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities		
}			
}			
}			
}			
}			
}			
}			

Table 9.3.4.5.3.3-11: LPP Provide Location Information (ULInformationTransfer, Table 9.3.4.5.3.3-8)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 7, Table 9.3.4.5.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	May be present. Any value acceptable		
nr-Multi-RTT-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 30		
nr-Multi-RTT-SignalMeasurementInformation-r16 SEQUENCE {			
nr-Multi-RTT-MeasList-r16 SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-Multi-RTT-MeasElement-r16 {	1 entry		
NR-Multi-RTT-MeasElement-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	Not checked		
nr-PhysCellID-r16	Not checked		
nr-CellGlobalID-r16	Not checked		
nr-ARFCN-r16	Not checked		
nr-DL-PRS-ResourceID-r16	Not checked		
nr-DL-PRS-ResourceSetID-r16	Not checked		
nr-UE-RxTxTimeDiff-r16	Present. Any value acceptable		
nr-AdditionalPathList-r16	Not checked		
nr-TimeStamp-r16	Not checked		
nr-TimingQuality-r16	Not checked		
nr-DL-PRS-RSRP-Result-r16	Not checked		
nr-Multi-RTT-AdditionalMeasurements-r16	Not checked		
nr-UE-RxTx-TEG-Info-r17	Not checked		
nr-DL-PRS-FirstPathRSRP-Result-r17	Not checked		
nr-los-nlos-Indicator-r17	Not checked		
nr-AdditionalPathListExt-r17	Not checked		
nr-Multi-RTT-AdditionalMeasurementsExt-r17	Not checked		
nr-MeasBasedOnAggregatedResources-r18	Not checked		
nr-AggregatedDL-PRS-ResourceInfo-List-r18	Not checked		
nr-RSCP-r18	Present. Any integer between (0..3599)		

nr-PhaseQuality-r18	Not checked		
nr-RSCP-AddSampleMeasurements-r18	Not checked		
nr-ReportDL-PRS-MeasBasedOnSingleOrMultiHopRx-r18	Not checked		
nr-NTN-UE-RxTxMeasurements-r18	Not checked		
}			
}			
nr-NTA-Offset-r16	Not checked		
nr-SRS-TxTEG-Set-r17	Not present		
nr-UE-RxTEG-TimingErrorMargin-r17	Not present		
nr-UE-TxTEG-TimingErrorMargin-r17	Not present		
nr-UE-RxTxTEG-TimingErrorMargin-r17	Not present		
}			
nr-Multi-RTT-Error-r16	Not present		
nr-Multi-RTT-SignalMeasurementInstances-r17	Not present		
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 32		
nr-DL-TDOA-SignalMeasurementInformation-r16 SEQUENCE {			
dl-PRS-ReferenceInfo-r16	Not checked		
nr-DL-TDOA-MeasList-r16 SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-DL-TDOA-MeasElement-r16 {	1 entry		
NR-DL-TDOA-MeasElement-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	Not checked		
nr-PhysCellID-r16	Not checked		
nr-CellGlobalID-r16	Not checked		
nr-ARFCN-r16	Not checked		
nr-DL-PRS-ResourceID-r16	Not checked		
nr-DL-PRS-ResourceSetID-r16	Not checked		
nr-TimeStamp-r16	Not checked		
nr-RSTD-r16	Present. Any value acceptable		
nr-AdditionalPathList-r16	Not checked		
nr-TimingQuality-r16	Not checked		
nr-DL-PRS-RSRP-Result-r16	Not checked		
nr-DL-TDOA-AdditionalMeasurements-r16	Not checked		
nr-UE-Rx-TEG-ID-r17	Not checked		
nr-DL-PRS-FirstPathRSRP-Result-r17	Not checked		
nr-los-nlos-Indicator-r17	Not checked		
nr-AdditionalPathListExt-r17	Not checked		
nr-DL-TDOA-AdditionalMeasurementsExt-r17	Not checked		
nr-MeasBasedOnAggregatedResources-r18	Not checked		
nr-AggregatedDL-PRS-ResourceInfo-List-r18	Not checked		
nr-RSCPD-r18	Present. Any integer between (0..3599)		
nr-PhaseQuality-r18	Not checked		
nr-RSCPD-AddMeasurementSamples-r18	Not checked		
nr-ReportDL-PRS-MeasBasedOnSingleOrMultiHopRx-r18	Not checked		
}			
}			
nr-UE-RxTEG-TimingErrorMargin-r17	Not present		
}			
nr-dl-tdoa-LocationInformation-r16	Not checked		
nr-DL-TDOA-Error-r16	Not present		

nr-DL-TDOA-SignalMeasurementInstances-r17	Not present		
nr-DL-TDOA-LocationInformationInstances-r17	Not present		
}			
}			
}			
}			
}			
}			
}			

9.3.4.6 LPP frequency hopping positioning procedure for Redcap UEs

9.3.4.6.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives assistance data and a LPP REQUEST LOCATION INFORMATION message indicating the
UE to use DL-PRS receiver frequency hopping for performing positioning measurements }
    then { UE sends a PROVIDE LOCATION INFORMATION message containing a location estimate and
indicates that the reported measurement is based on receiving single or multiple hops of DL-PRS }
}
```

9.3.4.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.214 clauses 5.1.6.5.1, and TS 38.305 clauses 8.10.2.2 and 8.10.3.1.3.1. Unless otherwise stated these are Rel-18 requirements.

[TS 38.214, clause 5.1.6.5.1]

The reduced capability UE may be configured to measure and report, subject to UE capability, via *nr-DL-PRS-RxHoppingRequest* the DL RSTD, DL PRS-RSRP, DL PRS-RSRPP, or UE Rx-Tx time difference using receiver frequency hopping for a DL PRS resource, with a requested bandwidth of all hops that may be greater than the maximum reduced capability UE bandwidth. The reduced capability UE performing receiver frequency hopping may report via *nr-ReportDL-PRS-MeasBasedOnSingleOrMultiHopRx* one measurement associated with one received frequency hop or one measurement based on multiple hops of the DL PRS. The reduced capability UE may report whether the measurement is associated with one received frequency hop or multiple frequency hops of the DL PRS. In RRC_CONNECTED mode, the reduced capability UE is expected to use a single instance of a configured measurement gap to receive all hops of the DL PRS using receiver frequency hopping.

[TS 38.305, clause 8.10.2.2]

The information that may be signalled from UE to the LMF is listed in Table 8.10.2.2-1. The individual UE measurements are defined in TS 38.215 [37].

Table 8.10.2.2-1: Measurement results that may be transferred from UE to the LMF

Information
PCI, GCI, and PRS ID, ARFCN, PRS resource ID, PRS resource set ID for each measurement
DL-PRS-RSRP measurement
UE Rx-Tx time difference measurement
DL-RSCP measurement[NOTE1, NOTE2]
Time stamp of the measurement
Quality for each measurement
TA offset used by UE
UE Rx TEG IDs, UE Tx TEG IDs, and UE RxTx TEG IDs associated with UE Rx-Tx time difference measurements
LOS/NLOS information for UE measurements
DL-PRS-RSRPP measurement
The association of UE Tx TEG ID and SRS
Indication that DL-PRS bandwidth aggregation has been used for UE Rx-Tx time difference measurement
Indication that the reported measurements are based on receiving single or multiple hops of DL-PRS
UE Rx – Tx time difference subframe offset
DL timing drift
NOTE 1: The DL-RSCP measurement may be reported along with the UE Rx-Tx time difference measurement. NOTE 2: The DL-RSCP is measured from a single DL PRS positioning frequency layer.

[TS 38.305, clause 8.10.3.1.3.1]

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.

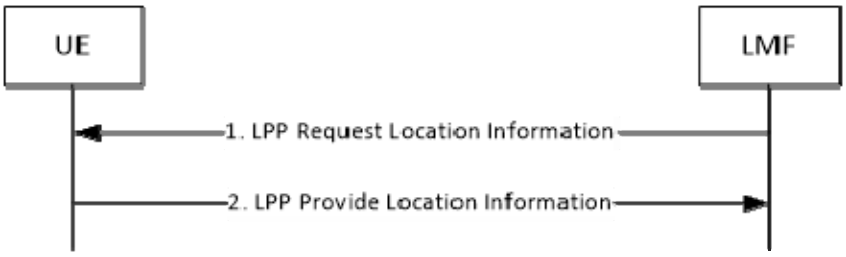

Figure 8.10.3.1.3.1-1: LMF-initiated Location Information Transfer Procedure

(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.

9.3.4.6.3 Test description

9.3.4.6.3.1 Pre-test conditions

System Simulator:

- Sub-test 30: NR Cell 1 as specified in 8.2.9 and system information combination NR-1 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.
- Sub-test 31: NR Cell 1 and NR Cell 2 as specified in 8.2.10 and system information combination NR-2 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.
- Sub-test 32: NR Cell 1, NR Cell 2 and NR Cell 3 as specified in 8.2.11 and system information combination NR-4 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- Then the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE to clear the stored assistance data in the UE.

Related PICS/PIXIT Statements:

-

9.3.4.6.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.3.4.6.3.2-1 below:

Table 9.3.4.6.3.2-1: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
30	UE supporting Multi-RTT (Rel-18 onwards)
31	UE supporting DL-AoD (Rel-18 onwards)
32	UE supporting DL-TDOA (Rel-18 onwards)

Table 9.3.4.6.3.2-2: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
B	NG-RAN NR	

Table 9.3.4.6.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends an LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
3	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4	The SS sends an LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
5	The SS sends an RRCReconfiguration message.	<--	RRCReconfiguration		
6	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete		
7	The SS sends an LPP message of type Request Location Information including a request for location estimate and location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
8	Check: Does the UE send an LPP message of type Provide Location Information including measurements results with frequency hopping indication?	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
9	IF the UE LPP message at step 8 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

9.3.4.6.3.3 Specific message contents

Table 9.3.4.6.3.3-1: RESET UE POSITIONING STORED INFORMATION (Preamble)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 30: 0 0 0 0 0 1 1 0 Sub-test 31: 0 0 0 0 1 0 0 0 Sub-test 32: 0 0 0 0 0 1 1 1	Sub-test 30: Multi-RTT Sub-test 31: DL-AoD Sub-test 32: DL-TDOA	

Table 9.3.4.6.3.3-2: DLInformationTransfer (step 1, step 3, step 4, step 7 and step 9, Table 9.3.4.6.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.6.3.3-3	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.6.3.3-3: DL NAS TRANSPORT (DLInformationTransfer, Table 9.3.4.6.3.3-2)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Steps 3 and 9: Set according to Table 9.3.4.6.3.3-4	LPP Acknowledgement	
	Step 4: Set according to Table 9.3.4.6.3.3-5	LPP Provide Assistance Data	
	Step 7: Set according to Table 9.3.4.6.3.3-7	LPP Request Location Information	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.3.4.6.3.3-4: LPP Acknowledgement (DLInformationTransfer, Table 9.3.4.6.3.3-2)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in steps 2 or 8, Table 9.3.4.6.3.2-3	
}			
lpp-MessageBody	Not present.		
}			

Table 9.3.4.6.3.3-5: LPP Provide Assistance data (DLInformationTransfer, Table 9.3.4.6.3.3-2)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
nr-Multi-RTT-ProvideAssistanceData-r16 SEQUENCE {			Sub-test 30
nr-DL-PRS-AssistanceData-r16	As defined in Table 9.3.4.6.3.3-6		
}			
nr-DL-AoD-ProvideAssistanceData-r16 SEQUENCE {			Sub-test 31
nr-DL-PRS-AssistanceData-r16	As defined in Table 9.3.4.6.3.3-6		
}			
nr-DL-TDOA-ProvideAssistanceData-r16 SEQUENCE {			Sub-test 32
nr-DL-PRS-AssistanceData-r16	As defined in Table 9.3.4.6.3.3-6		
}			
}			
}			
}			
}			
}			

Table 9.3.4.6.3.3-6: NR-DL-PRS-AssistanceData (LPP Provide Assistance data, Table 9.3.4.6.3.3-5)

Derivation Path: Table 8.4.1.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4.1.6-1 with the following exceptions:			
NR-DL-PRS-AssistanceData-r16 ::= SEQUENCE {			
nr-DL-PRS-AssistanceDataList-r16 SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF NR-DL-PRS-AssistanceDataPerFreq-r16 {	2 entries		
NR-DL-PRS-AssistanceDataPerFreq-r16[1] SEQUENCE {		entry 1	
nr-DL-PRS-PositioningFrequencyLayer-r16 SEQUENCE {			
dl-PRS-ResourceBandwidth-r16	61	268 PRBs	
}			
}			
NR-DL-PRS-AssistanceDataPerFreq-r16[2] SEQUENCE {		entry 2	In case of sub-test 32 UE-based DL-TDOA method supported by the UE as defined in clause 8.2.11
nr-DL-PRS-PositioningFrequencyLayer-r16 SEQUENCE {			
dl-PRS-ResourceBandwidth-r16	61	268 PRBs	
}			
}			
}			
}			
}			

Table 9.3.4.6.3.3-7: LPP Request Location Information (DLInformationTransfer, Table 9.3.4.6.3.3-2)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
requestLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestLocationInformation-r9 SEQUENCE {			
commonIEsRequestLocationInformation SEQUENCE {			
locationInformationType	locationMeasurementsPreferred		
}			
nr-Multi-RTT-RequestLocationInformation-r16 SEQUENCE {			Sub-test 30
nr-DL-PRS-RxHoppingRequest-r18 SEQUENCE {			
nr-DL-PRS-RxHoppingTotalBandwidth-r18 CHOICE {			
fr1	Set as the maximumPRS-BandwidthAcrossAllHopsFR1-r18 value reported by UE		pc_maximumPRS_BandwidthAcrossAllHopsFR1

fr2	Set as the maximumPRS-BandwidthAcrossAllHopsFR2-r18 value reported by UE		pc_maximumPRS_BandwidthAcrossAllHopsFR2
}			
}			
}			
nr-DL-AoD-RequestLocationInformation-r16 SEQUENCE {			Sub-test 31
nr-DL-PRS-RxHoppingRequest-r18 SEQUENCE {			
nr-DL-PRS-RxHoppingTotalBandwidth-r18 CHOICE {			
fr1	Set as the maximumPRS-BandwidthAcrossAllHopsFR1-r18 value reported by UE		pc_maximumPRS_BandwidthAcrossAllHopsFR1
fr2	Set as the maximumPRS-BandwidthAcrossAllHopsFR2-r18 value reported by UE		pc_maximumPRS_BandwidthAcrossAllHopsFR2
}			
}			
nr-DL-TDOA-RequestLocationInformation-r16 SEQUENCE {			Sub-test 32
nr-DL-PRS-RxHoppingRequest-r18 SEQUENCE {			
nr-DL-PRS-RxHoppingTotalBandwidth-r18 CHOICE {			
fr1	Set as the maximumPRS-BandwidthAcrossAllHopsFR1-r18 value reported by UE		pc_maximumPRS_BandwidthAcrossAllHopsFR1
fr2	Set as the maximumPRS-BandwidthAcrossAllHopsFR2-r18 value reported by UE		pc_maximumPRS_BandwidthAcrossAllHopsFR2
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.3.4.6.3.3-8: RRCReconfiguration (step 5, Table 9.3.4.6.3.2-3)

Derivation Path: TS 38.508-1, table 4.6.1-3			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
radioBearerConfig			
measConfig	MeasConfig as defined in Table 8.3.1-2		
lateNonCriticalExtension	Not present		
nonCriticalExtension SEQUENCE {			Sub-test 30
masterCellGroup	CellGroupConfig as defined in Table 8.3.2-2		
}			
}			
}			
}			

Table 9.3.4.6.3.3-9: ULInformationTransfer (step 2 and step 8, Table 9.3.4.6.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.3.4.6.3.3-10	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.3.4.6.3.3-10: UL NAS TRANSPORT (ULInformationTransfer, Table 9.3.4.6.3.3-9)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 2:** Set according to Table 9.3.4.6.3.3-11	LPP Provide Capabilities	
	Step 10: Set according to Table 9.3.4.6.3.3-12	LPP Provide Location Information	

Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 9.3.4.6.3.2-3)	

Table 9.3.4.6.3.3-11: LPP Provide Capabilities (ULInformationTransfer, Table 9.3.4.6.3.3-9)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 9.3.4.6.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities		
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities		
}			
}			
}			
}			
}			
}			
}			

Table 9.3.4.6.3.3-12: LPP Provide Location Information (ULInformationTransfer, Table 9.3.4.6.3.3-9)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 7, Table 9.3.4.6.3.3-7	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	May be present. Any value acceptable		
nr-Multi-RTT-ProvideLocationInformation-r16 SEQUENCE {			Present for sub-test 30
nr-Multi-RTT-SignalMeasurementInformation-r16 SEQUENCE {			
nr-Multi-RTT-MeasList-r16 SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-Multi-RTT-MeasElement-r16 {	1 entry		
NR-Multi-RTT-MeasElement-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	Not checked		
nr-PhysCellID-r16	Not checked		
nr-CellGlobalID-r16	Not checked		
nr-ARFCN-r16	Not checked		
nr-DL-PRS-ResourceID-r16	Not checked		
nr-DL-PRS-ResourceSetID-r16	Not checked		
nr-UE-RxTxTimeDiff-r16	Present. Any value acceptable		
nr-AdditionalPathList-r16	Not checked		
nr-TimeStamp-r16	Not checked		
nr-TimingQuality-r16	Not checked		
nr-DL-PRS-RSRP-Result-r16	Not checked		
nr-Multi-RTT-AdditionalMeasurements-r16	Not checked		
nr-UE-RxTx-TEG-Info-r17	Not checked		
nr-DL-PRS-FirstPathRSRP-Result-r17	Not checked		
nr-los-nlos-Indicator-r17	Not checked		
nr-AdditionalPathListExt-r17	Not checked		
nr-Multi-RTT-AdditionalMeasurementsExt-r17	Not checked		
nr-MeasBasedOnAggregatedResources-r18	Not checked		
nr-AggregatedDL-PRS-ResourceInfo-List-r18	Not checked		
nr-RSCP-r18	Not checked		
nr-PhaseQuality-r18	Not checked		

nr-RSCP-AddSampleMeasurements-r18	Not checked		
nr-ReportDL-PRS-MeasBasedOnSingleOrMultiHopRx-r18	Present. Any value acceptable		
nr-NTN-UE-RxTxMeasurements-r18	Not checked		
}			
}			
nr-NTA-Offset-r16	Not checked		
nr-SRS-TxTEG-Set-r17	Not present		
nr-UE-RxTEG-TimingErrorMargin-r17	Not present		
nr-UE-TxTEG-TimingErrorMargin-r17	Not present		
nr-UE-RxTxTEG-TimingErrorMargin-r17	Not present		
}			
nr-Multi-RTT-Error-r16	Not present		
nr-Multi-RTT-SignalMeasurementInstances-r17	Not present		
}			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {			Present for sub-test 31
nr-DL-AoD-SignalMeasurementInformation-r16 SEQUENCE {			
nr-DL-AoD-MeasList-r16 SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-DL-AoD-MeasElement-r16 {	2 entries		
NR-DL-AoD-MeasElement-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	Not checked		
nr-PhysCellID-r16	Not checked		
nr-CellGlobalID-r16	Not checked		
nr-ARFCN-r16	Not checked		
nr-DL-PRS-ResourceID-r16	Not checked		
nr-DL-PRS-ResourceSetID-r16	Not checked		
nr-TimeStamp-r16	Not checked		
nr-DL-PRS-RSRP-Result-r16	Present. Any value acceptable		
nr-DL-PRS-RxBeamIndex-r16	Not checked		
nr-DL-AoD-AdditionalMeasurements-r16	Not checked		
nr-DL-PRS-FirstPathRSRP-Result-r17	Not checked		
nr-los-nlos-Indicator-r17	Not checked		
nr-DL-AoD-AdditionalMeasurementsExt-r17	Not checked		
nr-ReportDL-PRS-MeasBasedOnSingleOrMultiHopRx-r18	Present. Any value acceptable		
}			
NR-DL-AoD-MeasElement-r16[2]		entry 2 NR-DL-AoD-MeasElement-r16[2] contains the same message contents as NR-DL-AoD-MeasElement-r16[1].	
}			
}			
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {			Present for sub-test 32
nr-DL-TDOA-SignalMeasurementInformation-r16 SEQUENCE {			
dl-PRS-ReferenceInfo-r16	Not checked		
nr-DL-TDOA-MeasList-r16 SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-DL-TDOA-MeasElement-r16 {	2 entries		

NR-DL-TDOA-MeasElement-r16[1] SEQUENCE {		entry 1	
dl-PRS-ID-r16	Not checked		
nr-PhysCellID-r16	Not checked		
nr-CellGlobalID-r16	Not checked		
nr-ARFCN-r16	Not checked		
nr-DL-PRS-ResourceID-r16	Not checked		
nr-DL-PRS-ResourceSetID-r16	Not checked		
nr-TimeStamp-r16	Not checked		
nr-RSTD-r16	Present. Any value acceptable		
nr-AdditionalPathList-r16	Not checked		
nr-TimingQuality-r16	Not checked		
nr-DL-PRS-RSRP-Result-r16	Not checked		
nr-DL-TDOA-AdditionalMeasurements-r16	Not checked		
nr-UE-Rx-TEG-ID-r17	Not checked		
nr-DL-PRS-FirstPathRSRP-Result-r17	Not checked		
nr-los-nlos-Indicator-r17	Not checked		
nr-AdditionalPathListExt-r17	Not checked		
nr-DL-TDOA-AdditionalMeasurementsExt-r17	Not checked		
nr-MeasBasedOnAggregatedResources-r18	Not checked		
nr-AggregatedDL-PRS-ResourceInfo-List-r18	Not checked		
nr-RSCPD-r18	Not checked		
nr-PhaseQuality-r18	Not checked		
nr-RSCPD-AddMeasurementSamples-r18	Not checked		
nr-ReportDL-PRS-MeasBasedOnSingleOrMultiHopRx-r18	Present. Any value acceptable		
}			
NR-DL-TDOA-MeasElement-r16[2]		entry 2 NR-DL-TDOA-MeasElement-r16[2] contains the same message contents as NR-DL-TDOA-MeasElement-r16[1].	
}			
nr-UE-RxTEG-TimingErrorMargin-r17	Not present		
}			
nr-dl-tdoa-LocationInformation-r16	Not checked		
nr-DL-TDOA-Error-r16	Not present		
nr-DL-TDOA-SignalMeasurementInstances-r17	Not present		
nr-DL-TDOA-LocationInformationInstances-r17	Not present		
}			
}			
}			
}			
}			
}			
}			

9.4 RRC Protocol Procedures

9.4.1 PosSIB broadcasting followed by location information transfer

9.4.1.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE has no assistance data stored and receives the positioning assistance data via posSIBs
and then UE receives a location request from LMF}
    then { the UE sends a PROVIDE LOCATION INFORMATION message containing a location estimate }
}
```

9.4.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 37.355 clauses 7.1, 7.2, and TS 38.331 clause 5.2.2.3.5. Unless otherwise stated these are Rel-16 requirements.

[TS 37.355, clause 7.1]

Broadcast of positioning assistance data is supported via Positioning System Information Blocks (posSIBs) as specified in TS 36.331 [12] or TS 38.331 [35]. The posSIBs are carried in RRC System Information (SI) messages (TS 36.331 [12] or TS 38.331 [35]).

For LTE RRC System Information (SI), a single *SystemInformationBlockPos* IE is defined in TS 36.331 [12] which is carried in IE *PosSystemInformation-r15-IEs* specified in TS 36.331 [12]. The mapping of positioning SIB type (*posSibType*) to assistance data carried in *SystemInformationBlockPos* is specified in clause 7.2.

For NR RRC System Information (SI), a single *SIBpos* IE is defined in TS 38.331 [35] which is carried in IE *PosSystemInformation-r16-IEs* specified in TS 38.331 [35]. The mapping of positioning SIB type (*posSibType*) to assistance data carried in *SIBpos* is specified in clause 7.2.

[TS 37.355, clause 7.2]

The supported *posSibType*'s are specified in Table 7.2-1. The GNSS Common and Generic Assistance Data IEs are defined in clause 6.5.2.2. The OTDOA Assistance Data IEs and NR DL-TDOA/DL-AoD Assistance Data IEs are defined in clause 7.4.2. The Barometric Assistance Data IEs are defined in clause 6.5.5.8. The TBS (based on MBS signals) Assistance Data IEs are defined in clause 6.5.4.8.

Table 7.2-1: Mapping of posSibType to assistanceDataElement

	posSibType	***assistanceDataElement***
GNSS Common Assistance Data (clause 6.5.2.2)	*posSibType1-1*	*GNSS-ReferenceTime*
	posSibType1-2	*GNSS-ReferenceLocation*
	posSibType1-3	*GNSS-IonosphericModel*
	posSibType1-4	*GNSS-EarthOrientationParameters*
	posSibType1-5	*GNSS-RTK-ReferenceStationInfo*
	posSibType1-6	*GNSS-RTK-CommonObservationInfo*
	posSibType1-7	*GNSS-RTK-AuxiliaryStationData*
	posSibType1-8	*GNSS-SSR-CorrectionPoints*
GNSS Generic Assistance Data (clause 6.5.2.2)	*posSibType2-1*	*GNSS-TimeModelList*
	posSibType2-2	*GNSS-DifferentialCorrections*
	posSibType2-3	*GNSS-NavigationModel*
	posSibType2-4	*GNSS-RealTimeIntegrity*
	posSibType2-5	*GNSS-DataBitAssistance*
	posSibType2-6	*GNSS-AcquisitionAssistance*
	posSibType2-7	*GNSS-Almanac*
	posSibType2-8	*GNSS-UTC-Model*
	posSibType2-9	*GNSS-AuxiliaryInformation*
	posSibType2-10	*BDS-DifferentialCorrections*
	posSibType2-11	*BDS-GridModelParameter*

	posSibType2-12	*GNSS-RTK-Observations*
	posSibType2-13	*GLO-RTK-BiasInformation*
	posSibType2-14	*GNSS-RTK-MAC-CorrectionDifferences*
	posSibType2-15	*GNSS-RTK-Residuals*
	posSibType2-16	*GNSS-RTK-FKP-Gradients*
	posSibType2-17	*GNSS-SSR-OrbitCorrections*
	posSibType2-18	*GNSS-SSR-ClockCorrections*
	posSibType2-19	*GNSS-SSR-CodeBias*
	posSibType2-20	*GNSS-SSR-URA*
	posSibType2-21	*GNSS-SSR-PhaseBias*
	posSibType2-22	*GNSS-SSR-STEC-Correction*
	posSibType2-23	*GNSS-SSR-GriddedCorrection*
	posSibType2-24	*NavIC-DifferentialCorrections*
	posSibType2-25	*NavIC-GridModelParameter*
OTDOA Assistance Data (clause 7.4.2)	*posSibType3-1*	*OTDOA-UE-Assisted*
Barometric Assistance Data (clause 6.5.5.8)	*posSibType4-1*	*Sensor-AssistanceDataList*
TBS Assistance Data (clause 6.5.4.8)	*posSibType5-1*	*TBS-AssistanceDataList*
NR DL-TDOA/DL-AoD Assistance Data (clauses 6.4.3, 7.4.2)	*posSibType6-1*	*NR-DL-PRS-AssistanceData*
	posSibType6-2	*NR-UEB-TRP-LocationData*
	posSibType6-3	*NR-UEB-TRP-RTD-Info*

[TS 38.331, clause 5.2.2.3.5]

The UE shall:

1> if the UE is in RRC_CONNECTED with an active BWP not configured with common search space with the field *searchSpaceOtherSystemInformation* and the UE has not stored a valid version of a SIB or posSIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s) or posSIB(s) in accordance with sub-clause 5.2.2.1:

2> for the SI message(s) that, according to the *si-SchedulingInfo* or *posSI-SchedulingInfo* in the stored SIB1, contain at least one required SIB or requested posSIB:

3> if *onDemandSIB-Request* is configured and timer T350 is not running:

4> initiate transmission of the *DedicatedSIBRequest* message in accordance with 5.2.2.3.6;

4> start timer T350 with the timer value set to the *onDemandSIB-RequestProhibitTimer*;

1> else if the UE is in RRC_CONNECTED with an active BWP configured with common search space with the field *searchSpaceOtherSystemInformation* and the UE has not stored a valid version of a SIB or posSIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s) or posSIB(s) in accordance with sub-clause 5.2.2.1:

2> for the SI message(s) that, according to the *si-SchedulingInfo* in the stored SIB1, contain at least one required SIB and for which *si-BroadcastStatus* is set to *broadcasting*:

3> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2;

2> for the SI message(s) that, according to the *si-SchedulingInfo* in the stored SIB1, contain at least one required SIB and for which *si-BroadcastStatus* is set to *notBroadcasting*:

3> if *onDemandSIB-Request* is configured and timer T350 is not running:

4> initiate transmission of the *DedicatedSIBRequest* message in accordance with 5.2.2.3.6;

4> start timer T350 with the timer value set to the *onDemandSIB-RequestProhibitTimer*;

4> acquire the requested SI message(s) corresponding to the requested SIB(s) as defined in sub-clause 5.2.2.3.2.

2> for the SI message(s) that, according to the *posSI-SchedulingInfo* in the stored SIB1, contain at least one requested posSIB and for which *posSI-BroadcastStatus* is set to *broadcasting*:

3> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2;

2> for the SI message(s) that, according to the *posSI-SchedulingInfo* in the stored SIB1, contain at least one requested posSIB and for which *posSI-BroadcastStatus* is set to *notBroadcasting*:

3> if *onDemandSIB-Request* is configured and timer T350 is not running:

4> initiate transmission of the *DedicatedSIBRequest* message in accordance with 5.2.2.3.6;

4> start timer T350 with the timer value set to the *onDemandSIB-RequestProhibitTimer*;

4> acquire the requested SI message(s) corresponding to the requested posSIB(s) as defined in sub-clause 5.2.2.3.2.

NOTE: UE may include on demand request for SIB and/or posSIB(s) in the same *DedicatedSIBRequest* message.

9.4.1.3 Test description

9.4.1.3.1 Pre-test conditions

System Simulator:

For Test Configuration B (Table 9.4.1.3.2-2): NR Cell 1 and system information combination NR-1 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.

- Satellite signals (sub-test case 25): as specified in 8.2.1.
- MBS signals (Sub-test 23): as specified in 8.2.4.
- Sub-test 20: NR Cell 1 and NR Cell 2 as specified in 8.2.10 and system information combination NR-2 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.
- Sub-test 21: NR Cell 1, NR Cell 2 and NR Cell 3 as specified in 8.2.11 and system information combination NR-4 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- For Test Configuration B (Table 9.4.1.3.2-2): The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- Then the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE to clear the stored assistance data in the UE.
- The UE is switched-off.

Related PICS/PIXIT Statements:

-

9.4.1.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.4.1.3.2-1 below:

Table 9.4.1.3.2-1: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
23	UE supporting MBS(2) (Rel-16 onwards)
24	UE supporting Sensor (Rel-16 onwards)
25	UE supporting GNSS(1) (Rel-15 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 9.4.1.3.2-2: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
B	NG-RAN NR	

Table 9.4.1.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The UE is switched on.			-	-
2	System information that includes the needed posSystemInformation is broadcasted. Note: The sysinfo combination is NR-16 for Sub-test 20, NR-17 for Sub-test 21, NR-15 for Sub-test 23, Sub-test 24 and Sub-test 25.	<--	RRC: SYSTEM INFORMATION (BCCH)	-	-
3-10	Steps 1 to 8 of the NR RRC_CONNECTED procedure in TS 38.508-1 [3] Table 4.5.4.2-3 are executed.	-	-		
-	EXCEPTION: Steps 11a1 to 11a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported.				
11a1	IF sub-test 20 or 21 THEN The SS sends an RRCReconfiguration message as in Table 8.3.1-1 to configure the measurement gap.	<--	RRC RRCReconfiguration	-	-
11a2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-
12	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
13	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
14	IF the UE LPP message at step 13 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
15	The SS sends a LPP message of type Request Location Information including a request for location estimate and location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
16	The UE sends a LPP message of type Provide Location Information including location estimate.	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	1	P
17	IF the UE LPP message at step 16 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

9.4.1.3.3 Specific message contents

Table 9.4.1.3.3-1: RESET UE POSITIONING STORED INFORMATION (Preamble)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 20: 0 0 0 0 0 1 0 0 0 Sub-test 21: 0 0 0 0 0 0 1 1 1 Sub-test 23: 0 0 0 0 0 0 0 1 0 Sub-test 24: 0 0 0 0 0 0 1 0 1 Sub-test 25: 0 0 0 0 0 0 0 0 0	Sub-test 20: DL-AoD Sub-test 21: DL-TDOA Sub-test 23: MBS Sub-test 24: Sensor Sub-test 25: GNSS	

Table 9.4.1.3.3-2: SIB1 (step 2, Table 9.4.1.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-28 with condition posSIB.

Table 9.4.1.3.3-3: PosSI-SchedulingInfo (SIB1, Table 9.4.1.3.3-2)

Derivation Path: TS 38.508-1, Table 4.6.2a-2			
Information Element	**Value/remark**	**Comment**	**Condition**
PosSI-SchedulingInfo-r16 ::= SEQUENCE {			
posSchedulingInfoList-r16 SEQUENCE (SIZE (1..maxSI-Message)) OF PosSchedulingInfo-r16 {	2 entries	The size of PosSchedulingInfo-r16 is 1 for Sub-tests 20, 21, 23 and 24. If Sub-test 25 and UE supports X GNSS systems, the size of PosSchedulingInfo-r16 is (X+1) and the PosSchedulingInfo-r16 needs to be broadcasted X times, once for each different GNSS.	
PosSchedulingInfo-r16[1] SEQUENCE {		entry 1	
posSIB-MappingInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16 {	3 entries for Sub-test 25, 1 entry for Sub-tests 20, 21, 23 and 24	PosSibType-n = posSibType1-1, posSibType1-2, posSibType1-3	Sub-test 25
		PosSibType-n = posSibType4-1	Sub-test 24
		PosSibType-n = posSibType5-1	Sub-test 23
		PosSibType-n = posSibType6-1	Sub-test 20 or Sub-test 21

PosSIB-Type-r16[n] SEQUENCE {		entry n	
encrypted-r16	Not present		
gnss-id-r16	Not present		
sbas-id-r16	Not present		
posSibType-r16	PosSibType-n	The posSibType-r16 is depending on the sub–test cases and entry number n	
areaScope-r16	Not present		
}			
}			
}			
PosSchedulingInfo-r16[2] SEQUENCE {		entry 2 If the UE supports X GNSS systems, the PosSchedulingInfo-r16 needs to be broadcasted X times, once for each different GNSS.	Sub-test 25
posSIB-MappingInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16 {	6 entries for Sub-test 25	posSibType2-1, posSibType2-3, posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9	
PosSIB-Type-r16[m] SEQUENCE {		entry m	
encrypted-r16	Not present		
gnss-id-r16	Set depending on the GNSS supported by the UE		
sbas-id-r16	Not present		
posSibType-r16	PosSibType-m,	The posSibType-r16 is depending on the entry number m	
areaScope-r16	Not present		
}			
}			
}			
}			
}			

Table 9.4.1.3.3-4: SystemInformation – Sub-tests 20, 21, 23 and 24 (step 2, Table 9.4.1.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-29 with condition posSIB.

Table 9.4.1.3.3-4A: SystemInformation – Sub-test 25, message 1 (step 2, Table 9.4.1.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-29 with condition posSIB and posSib1-x.

Table 9.4.1.3.3-4B: SystemInformation – Sub-test 25, message 2 and subsequent (step 2, Table 9.4.1.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-29 with condition posSIB and posSib2-x.

Table 9.4.1.3.3-5: PosSystemInformation-r16-IEs (step 2, Table 9.4.1.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.2a-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PosSystemInformation-r16-IEs ::= SEQUENCE {			
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	3 entries		Sub-test 25 posSib1-x
posSib1-1-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 1	
posSib1-2-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 2	
posSib1-3-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 3	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	6 entries		Sub-test 25, posSib2-x
posSib2-1-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 1	
posSib2-3-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 2	
posSib2-6-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 3	
posSib2-7-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 4	
posSib2-8-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 5	
posSib2-9-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 6	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	1 entry		Sub-test 24
posSib4-1-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 1	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	1 entry		Sub-test 23
posSib5-1-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 1	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	1 entry		Sub-test 20, Sub-test 21
posSib6-1-r16	SIBpos as defined in Table 9.4.1.3.3-6	entry 1	
}			
lateNonCriticalExtension	Not present		
nonCriticalExtension	Not present		
}			

Table 9.4.1.3.3-6: SIBpos (PosSystemInformation-r16-IEs, Table 9.4.1.3.3-5)

Derivation Path: TS 38.501-1, Table 4.6.2a-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SIBpos-r16 ::= SEQUENCE {			
assistanceDataSIB-Element-r16	OCTET STRING containing AssistanceDataSIBelement		
}			

Table 9.4.1.3.3-7: AssistanceDataSIBelement

Derivation Path: TS 37.355, clause 7.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
AssistanceDataSIBelement-r15 ::= SEQUENCE {			
valueTag-r15	Not present		
expirationTime-r15	Not present		
cipheringKeyData-r15	Not present		
segmentationInfo-r15	Not present		Not present when the posSIB is not segmented
segmentationInfo-r15 SEQUENCE {			Present when the posSIB is segmented
segmentationOption-r15	octet-string-seg		
assistanceDataSegmentType-r15	notLastSegment		Used when posSIB is segmented and the segment is not the last segment
	lastSegment		Used when posSIB is not segmented, or posSIB is segmented and the segment is the last segment
assistanceDataSegmentNumber-r15	index of the segmented posSIB		
}			
assistanceDataElement-r15	OCTET STRING containing LPP IEs (GNSS-ReferenceTime, GNSS-ReferenceLocation, GNSS-IonosphericModel,GNSS-TimeModelList, GNSS-NavigationModel, GNSS-AcquisitionAssistance, GNSS-Almanac, GNSS-UTC-Model, GNSS-AuxiliaryInformation) as defined in TS 37.571-5 [12] and mapped according to the content of posSibType-r16 in Table 9.4.1.3.3-3.		Sub-test 25
	OCTET STRING containing sensor-AssistanceDataList as defined in Table 8.4-1		Sub-test 24
	OCTET STRING containing tbs-AssistanceDataList as defined in Table 8.4-1		Sub-test 23
	OCTET STRING containing NR-DL-PRS-AssistanceData as defined in Table 8.4.1.6-1.		Sub-test 20, Sub-test 21
}			

Table 9.4.1.3.3-8: DLInformationTransfer (step 12, step 14, step 15 and step 17, Table 9.4.1.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.1.3.3-9	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.1.3.3-9: DL NAS TRANSPORT (DLInformationTransfer, Table 9.4.1.3.2-8)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 12:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 15: Set according to Table 9.3.4.1.3.3-10	LPP Request Location Information	
	Steps 14 and 17: Set according to Table 9.4.1.3.3-11	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.4.1.3.3-10: LPP Request Location Information (DL NAS TRANSPORT, Table 9.4.1.3.2-9)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsPreferred		

Table 9.4.1.3.3-11: LPP Acknowledgement (DL NAS TRANSPORT, Table 9.4.1.3.2-9)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same	

		value of the sequenceNumber field in step 13 or 16, Table 9.4.1.3.2-3	
}			
lpp-MessageBody	Not present.		
}			

Table 9.4.1.3.3-12: ULInformationTransfer (steps 13 and 16, Table 9.4.1.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.1.3.3-13	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.1.3.3-13: UL NAS TRANSPORT (ULInformationTransfer, Table 9.4.1.3.3-12)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 13:** Set according to Table 9.4.1.3.3-14	LPP Provide Capabilities	
	Step 16: Set according to Table 9.4.1.3.3-15	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 12 Table 9.4.1.3.2-3)	

Table 9.4.1.3.3-14: LPP Provide Capabilities (UL NAS TRANSPORT, Table 9.4.1.3.3-13)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 12, Table 9.4.1.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-16 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.4.1.3.3-15: LPP Provide Location Information (UL NAS TRANSPORT, Table 9.4.1.3.3-13)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 15, Table 9.4.1.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	May be present. Any value acceptable		
a-gnss-ProvideLocationInformation SEQUENCE {	Present for sub-test 25		
gnss-SignalMeasurementInformation SEQUENCE {	Present.		
measurementReferenceTime	Any value acceptable		
gnss-MeasurementList	Any value acceptable		
}			
gnss-LocationInformation SEQUENCE {	May be present		
measurementReferenceTime	Any value acceptable		
agnss-List	Any value acceptable		
}			
gnss-Error	Not present		
}			
sensor-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 24	Rel-16 onwards	
sensor-MeasurementInformation-r13	Present. Any value acceptable		
sensor-Error-r13	Not present		
sensor-MotionInformation-r15	May be present		
}			
tbs-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 23	Rel-16 onwards	
tbs-MeasurementInformation-r13	Present. Any value acceptable		
tbs-Error-r13	Not present		
}			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 20	Rel-16 onwards	
nr-DL-AoD-SignalMeasurementInformation-r16 SEQUENCE {	Present.		
nr-DL-AoD-MeasList-r16	Any value acceptable		
}			
nr-dl-AoD-LocationInformation-r16	May be present		
nr-DL-AoD-Error-r16	Not present		
}			

nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 21	Rel-16 onwards	
nr-DL-TDOA-SignalMeasurementInformation-r16 SEQUENCE {	Present.		
dl-PRS-ReferenceInfo-r16	Any value acceptable		
nr-DL-TDOA-MeasList-r16	Any value acceptable		
}			
nr-dl-tdoa-LocationInformation-r16	May be present		
nr-DL-TDOA-Error-r16	Not present		
}			
}			
}			
}			
}			
}			
}			

9.4.2 PosSIB broadcasting followed by location information transfer / Positioning SI messages offset

9.4.2.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE has no assistance data stored and receives the positioning assistance data via posSIBs
and offsetToSI-Used-r16 is present and then UE receives a location request from LMF}
    then { the UE acquires the SI message at the correct position and then sends a PROVIDE LOCATION
INFORMATION message containing a location estimate }
}
```

9.4.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.331 clauses 5.2.2.3.2. Unless otherwise stated these are Rel-16 requirements.

[TS 38.331, clause 5.2.2.3.2]

For SI message acquisition PDCCH monitoring occasion(s) are determined according to *searchSpaceOtherSystemInformation*. If *searchSpaceOtherSystemInformation* is set to zero, PDCCH monitoring occasions for SI message reception in SI-window are same as PDCCH monitoring occasions for *SIB1* where the mapping between PDCCH monitoring occasions and SSBs is specified in TS 38.213[13]. If *searchSpaceOtherSystemInformation* is not set to zero, PDCCH monitoring occasions for SI message are determined based on search space indicated by *searchSpaceOtherSystemInformation*. PDCCH monitoring occasions for SI message which are not overlapping with UL symbols (determined according to *tdd-UL-DL-ConfigurationCommon*) are sequentially numbered from one in the SI window. The $[x \times N+K]^{th}$ PDCCH monitoring occasion (s) for SI message in SI-window corresponds to the K^{th} transmitted SSB, where x = 0, 1, ...X-1, K = 1, 2, …N, N is the number of actual transmitted SSBs determined according to *ssb-PositionsInBurst* in *SIB1* and X is equal to CEIL(number of PDCCH monitoring occasions in SI-window/N). The actual transmitted SSBs are sequentially numbered from one in ascending order of their SSB indexes. The UE assumes that, in the SI window, PDCCH for an SI message is transmitted in at least one PDCCH monitoring occasion corresponding to each transmitted SSB and thus the selection of SSB for the reception SI messages is up to UE implementation.

When acquiring an SI message, the UE shall:

1> determine the start of the SI-window for the concerned SI message as follows:

2> if the concerned SI message is configured in the *schedulingInfoList*:

3> for the concerned SI message, determine the number *n* which corresponds to the order of entry in the list of SI messages configured by *schedulingInfoList* in *si-SchedulingInfo* in *SIB1*;

3> determine the integer value $x = (n – 1) \times w$, where w is the *si-WindowLength*;

3> the SI-window starts at the slot #a, where $a = x$ mod N, in the radio frame for which SFN mod T = FLOOR(x/N), where T is the *si-Periodicity* of the concerned SI message and N is the number of slots in a radio frame as specified in TS 38.213 [13];

2> else if the concerned SI message is configured in the *posSchedulingInfoList* and *offsetToSI-Used* is not configured:

3> create a concatenated list of SI messages by appending the *posSchedulingInfoList* in *posSI-SchedulingInfo* in *SIB1* to *schedulingInfoList* in *si-SchedulingInfo* in *SIB1*;

3> for the concerned SI message, determine the number n which corresponds to the order of entry in the concatenated list;

3> determine the integer value $x = (n – 1) \times w$, where w is the *si-WindowLength*;

3> the SI-window starts at the slot #a, where $a = x$ mod N, in the radio frame for which SFN mod T = FLOOR(x/N), where T is the *posSI-Periodicity* of the concerned SI message and N is the number of slots in a radio frame as specified in TS 38.213 [13];

2> else if the concerned SI message is configured by the *posSchedulingInfoList* and *offsetToSI-Used* is configured:

3> determine the number m which corresponds to the number of SI messages with an associated *si-Periodicity* of 8 radio frames (80 ms), configured by *schedulingInfoList* in *SIB1*;

3> for the concerned SI message, determine the number n which corresponds to the order of entry in the list of SI messages configured by *posSchedulingInfoList* in *SIB1*;

3> determine the integer value $x = m \times w + (n – 1) \times w$, where w is the *si-WindowLength;*

3> the SI-window starts at the slot #a, where $a = x$ mod N, in the radio frame for which SFN mod T = FLOOR(x/N) +8, where T is the *posSI-Periodicity* of the concerned SI message and N is the number of slots in a radio frame as specified in TS 38.213 [13];.

9.4.2.3 Test description

9.4.2.3.1 Pre-test conditions

Same as in clause 9.4.1.3.1.

9.4.2.3.2 Test procedure sequence

Same as in clause 9.4.1.3.2.

9.4.2.3.3 Specific message contents

Same as 9.4.1.3.3 except that Table 9.4.2.3.3-1 replaces Table 9.4.1.3.3-3.

Table 9.4.2.3.3-1: PosSI-SchedulingInfo (SIB1, Table 9.4.1.3.3-2)

Derivation Path: TS 38.508-1, Table 4.6.2a-2			
Information Element	**Value/remark**	**Comment**	**Condition**
PosSI-SchedulingInfo-r16 ::= SEQUENCE {			
posSchedulingInfoList-r16 SEQUENCE (SIZE (1..maxSI-Message)) OF PosSchedulingInfo-r16 {	2 entries	The size of PosSchedulingInfo-r16 is 1 for Sub-tests 20, 21, 23 and 24. If Sub-test 25 and UE supports X GNSS systems, the size of PosSchedulingInfo-r16 is (X+1) and the PosSchedulingInfo-r16 needs to be broadcasted X times, once for each different GNSS.	
PosSchedulingInfo-r16[1] SEQUENCE {		entry 1	
offsetToSI-Used-r16	true		
posSIB-MappingInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16 {	3 entries for Sub-test 25, 1 entry for Sub-tests 20, 21, 23 and 24	PosSibType-n = posSibType1-1, posSibType1-2, posSibType1-3	Sub-test 25
		PosSibType-n = posSibType4-1	Sub-test 24
		PosSibType-n = posSibType5-1	Sub-test 23
		PosSibType-n = posSibType6-1	Sub-test 20 or Sub-test 21

PosSIB-Type-r16[n] SEQUENCE {		entry n	
encrypted-r16	Not present		
gnss-id-r16	Not present		
sbas-id-r16	Not present		
posSibType-r16	PosSibType-n	The posSibType-r16 is depending on the sub–test cases and entry number n	
areaScope-r16	Not present		
}			
}			
}			
PosSchedulingInfo-r16[2] SEQUENCE {		entry 2 If the UE supports X GNSS systems, the PosSchedulingInfo-r16 needs to be broadcasted X times, once for each different GNSS.	Sub-test 25
offsetToSI-Used-r16	true		
posSIB-MappingInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16 {	6 entries for Sub-test 25	posSibType2-1, posSibType2-3, posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9	
PosSIB-Type-r16[m] SEQUENCE {		entry m	
encrypted-r16	Not present		
gnss-id-r16	Set depending on the GNSS supported by the UE		
sbas-id-r16	Not present		
posSibType-r16	PosSibType-m,	The posSibType-r16 is depending on the entry number m	
areaScope-r16	Not present		
}			
}			
}			
}			
}			

9.4.3 On-demand PosSIB followed by location information transfer / RRC_connected state

9.4.3.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE has no assistance data stored and receives a REQUEST LOCATION INFORMATION message }
    then { the UE sends the DedicatedSIBRequest message indicating the requested posSIB }
}
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
```

```
  when { UE receives the positioning assistance data via posSIBs after sending the onDemandSIB-
Request message }
    then { the UE sends a PROVIDE LOCATION INFORMATION message containing a location estimate }
}
```

9.4.3.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.331 clauses 5.2.2.1, 5.2.2.3.5, 5.2.2.3.6 and TS 37.355 clause7.2. Unless otherwise stated these are Rel-16 requirements.

[TS 38.331, clause 5.2.2.1]

The UE applies the SI acquisition procedure to acquire the AS, NAS- and positioning assistance data information. The procedure applies to UEs in RRC_IDLE, in RRC_INACTIVE and in RRC_CONNECTED.

[TS 38.331, clause 5.2.2.3.5]

The UE shall:

1> if the UE is in RRC_CONNECTED with an active BWP not configured with common search space with the field *searchSpaceOtherSystemInformation* and the UE has not stored a valid version of a SIB or posSIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s) or posSIB(s) in accordance with sub-clause 5.2.2.1:

2> for the SI message(s) that, according to the *si-SchedulingInfo* or *posSI-SchedulingInfo* in the stored SIB1, contain at least one required SIB or requested posSIB:

3> if *onDemandSIB-Request* is configured and timer T350 is not running:

4> initiate transmission of the *DedicatedSIBRequest* message in accordance with 5.2.2.3.6;

4> start timer T350 with the timer value set to the *onDemandSIB-RequestProhibitTimer*;

1> else if the UE is in RRC_CONNECTED with an active BWP configured with common search space with the field *searchSpaceOtherSystemInformation* and the UE has not stored a valid version of a SIB or posSIB, in accordance with sub-clause 5.2.2.2.1, of one or several required SIB(s) or posSIB(s) in accordance with sub-clause 5.2.2.1:

…

2> for the SI message(s) that, according to the *posSI-SchedulingInfo* in the stored SIB1, contain at least one requested posSIB and for which *posSI-BroadcastStatus* is set to *broadcasting*:

3> acquire the SI message(s) as defined in sub-clause 5.2.2.3.2;

2> for the SI message(s) that, according to the *posSI-SchedulingInfo* in the stored SIB1, contain at least one requested posSIB and for which *posSI-BroadcastStatus* is set to *notBroadcasting*:

3> if *onDemandSIB-Request* is configured and timer T350 is not running:

4> initiate transmission of the *DedicatedSIBRequest* message in accordance with 5.2.2.3.6;

4> start timer T350 with the timer value set to the *onDemandSIB-RequestProhibitTimer*;

4> acquire the requested SI message(s) corresponding to the requested posSIB(s) as defined in sub-clause 5.2.2.3.2.

[TS 38.331, clause 5.2.2.3.6]

The UE shall set the contents of *DedicatedSIBRequest* message as follows:

1> if the procedure is triggered to request the required SIB(s):

2> include *requestedSIB-List* in the *onDemandSIB-RequestList* to indicate the requested SIB(s);

1> if the procedure is triggered to request the required posSIB(s):

2> include *requestedPosSIB-List* in the *onDemandSIB-RequestList* to indicate the requested posSIB(s).

The UE shall submit the *DedicatedSIBRequest* message to lower layers for transmission.

[TS 37.355, clause 7.2]

The supported *posSibType*'s are specified in Table 7.2-1. The GNSS Common and Generic Assistance Data IEs are defined in clause 6.5.2.2. The OTDOA Assistance Data IEs and NR DL-TDOA/DL-AoD Assistance Data IEs are defined in clause 7.4.2. The Barometric Assistance Data IEs are defined in clause 6.5.5.8. The TBS (based on MBS signals) Assistance Data IEs are defined in clause 6.5.4.8.

Table 7.2-1: Mapping of posSibType to assistanceDataElement

	posSibType	***assistanceDataElement***
GNSS Common Assistance Data (clause 6.5.2.2)	*posSibType1-1*	*GNSS-ReferenceTime*
	posSibType1-2	*GNSS-ReferenceLocation*
	posSibType1-3	*GNSS-IonosphericModel*
	posSibType1-4	*GNSS-EarthOrientationParameters*
	posSibType1-5	*GNSS-RTK-ReferenceStationInfo*
	posSibType1-6	*GNSS-RTK-CommonObservationInfo*
	posSibType1-7	*GNSS-RTK-AuxiliaryStationData*
	posSibType1-8	*GNSS-SSR-CorrectionPoints*
GNSS Generic Assistance Data (clause 6.5.2.2)	*posSibType2-1*	*GNSS-TimeModelList*
	posSibType2-2	*GNSS-DifferentialCorrections*
	posSibType2-3	*GNSS-NavigationModel*
	posSibType2-4	*GNSS-RealTimeIntegrity*
	posSibType2-5	*GNSS-DataBitAssistance*
	posSibType2-6	*GNSS-AcquisitionAssistance*
	posSibType2-7	*GNSS-Almanac*
	posSibType2-8	*GNSS-UTC-Model*
	posSibType2-9	*GNSS-AuxiliaryInformation*
	posSibType2-10	*BDS-DifferentialCorrections*
	posSibType2-11	*BDS-GridModelParameter*
	posSibType2-12	*GNSS-RTK-Observations*
	posSibType2-13	*GLO-RTK-BiasInformation*
	posSibType2-14	*GNSS-RTK-MAC-CorrectionDifferences*
	posSibType2-15	*GNSS-RTK-Residuals*
	posSibType2-16	*GNSS-RTK-FKP-Gradients*
	posSibType2-17	*GNSS-SSR-OrbitCorrections*
	posSibType2-18	*GNSS-SSR-ClockCorrections*
	posSibType2-19	*GNSS-SSR-CodeBias*
	posSibType2-20	*GNSS-SSR-URA*
	posSibType2-21	*GNSS-SSR-PhaseBias*
	posSibType2-22	*GNSS-SSR-STEC-Correction*
	posSibType2-23	*GNSS-SSR-GriddedCorrection*
	posSibType2-24	*NavIC-DifferentialCorrections*
	posSibType2-25	*NavIC-GridModelParameter*
OTDOA Assistance Data (clause 7.4.2)	*posSibType3-1*	*OTDOA-UE-Assisted*
Barometric Assistance Data (clause 6.5.5.8)	*posSibType4-1*	*Sensor-AssistanceDataList*
TBS Assistance Data (clause 6.5.4.8)	*posSibType5-1*	*TBS-AssistanceDataList*
NR DL-TDOA/DL-AoD Assistance Data (clauses 6.4.3, 7.4.2)	*posSibType6-1*	*NR-DL-PRS-AssistanceData*
	posSibType6-2	*NR-UEB-TRP-LocationData*
	posSibType6-3	*NR-UEB-TRP-RTD-Info*

9.4.3.3 Test description

9.4.3.3.1 Pre-test conditions

System Simulator:

- Sub-test 23, sub-test 24 and sub-test 25: NR Cell 1 and system information combination NR-1 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.
- Satellite signals (sub-test case 25): as specified in 8.2.1.
- MBS signals (Sub-test 23): as specified in 8.2.4.
- Sub-test 20: NR Cell 1 and NR Cell 2 as specified in 8.2.10 and system information combination NR-2 as defined in TS 38.508-1 [30] clause 4.4.3.1.2.
- Sub-test 21: NR Cell 1, NR Cell 2 and NR Cell 3 as specified in 8.2.11 and system information combination NR-4 as defined in TS 38.508-1 [30] clause 4.4.3.1.2..

UE:

The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- Then the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE to clear the stored assistance data in the UE.

Related PICS/PIXIT Statements:

-

9.4.3.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a Sub-Test Case Number as defined in Table 9.4.3.3.2-1 below:

Table 9.4.3.3.2-1: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
20	UE supporting DL-AoD (Rel-16 onwards)
21	UE supporting DL-TDOA (Rel-16 onwards)
23	UE supporting MBS(2) (Rel-16 onwards)
24	UE supporting Sensor (Rel-16 onwards)
25	UE supporting GNSS(1) (Rel-15 onwards)
NOTE 1: The GNSS combination of GPS, GLONASS, Galileo, BDS supported by the UE	

Table 9.4.3.3.2-2: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
B	NG-RAN NR	

Table 9.4.3.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
-	EXCEPTION: Steps 1a1 to 1a2 describe behaviour that depends on the UE capability; the "lower case letter" identifies a step sequence that takes place if a capability is supported.				
1a1	IF sub-test 20 or 21 THEN The SS sends an RRCReconfiguration message as in Table 8.3.1-1 to configure the measurement gap.	<--	RRC RRCReconfiguration	-	-
1a2	The UE sends an RRCReconfigurationComplete message.	-->	RRCReconfigurationComplete	-	-
2	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
3	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
4	IF the UE LPP message at step 3 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
5	The SS sends a LPP message of type Request Location Information including a request for location estimate and location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
6	Check: Does the UE send the DedicatedSIBRequest message indicating the requested posSIBs within 5 S?	-->	RRC: DedicatedSIBRequest	1	P
-	EXCEPTION: In parallel to events described in step 6 steps 7a and 7b may take place.				
7a	The UE sends the LPP message of type REQUEST ASSISTANCE DATA message	-->	*ULInformationTransfer* (LPP REQUEST ASSISTANCE DATA)		
7b	The SS does not respond to the LPP REQUEST ASSISTANCE DATA message.				
8	The requested posSIBs that includes the needed posSystemInformation are broadcasted. NOTE: The sysinfo combination is NR-16 for Sub-test 20, NR-17 for Sub-test 21, NR-15 for Sub-test 23, Sub-test 24 and Sub-test 25.	<--	RRC: SYSTEM INFORMATION (BCCH)		
9	Check: Does the UE send an LPP message of type Provide Location Information including location estimate?	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	2	P
10	IF the UE LPP message at step 9 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

9.4.3.3.3 Specific message contents

Table 9.4.3.3.3-1: RESET UE POSITIONING STORED INFORMATION (Preamble)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**

UE Positioning Technology	Sub-test 20: 0 0 0 0 1 0 0 0 Sub-test 21: 0 0 0 0 0 1 1 1 Sub-test 23: 0 0 0 0 0 0 1 0 Sub-test 24: 0 0 0 0 0 1 0 1 Sub-test 25: 0 0 0 0 0 0 0 0	Sub-test 20: DL-AoD Sub-test 21: DL-TDOA Sub-test 23: MBS Sub-test 24: Sensor Sub-test 25: GNSS	

Table 9.4.3.3.3-2: SIB1 (Preamble)

Derivation Path: TS 38.508-1, Table 4.6.1-28 with condition posSIB.

Table 9.4.3.3.3-3: PosSI-SchedulingInfo (SIB1, Table 9.4.3.3.3-2)

Derivation Path: TS 38.508-1, Table 4.6.2a-2			
Information Element	**Value/remark**	**Comment**	**Condition**
PosSI-SchedulingInfo-r16 ::= SEQUENCE {			
posSchedulingInfoList-r16 SEQUENCE (SIZE (1..maxSI-Message)) OF PosSchedulingInfo-r16 {	2 entries	The size of PosSchedulingInfo-r16 is 1 for Sub-tests 20, 21, 23 and 24. If Sub-test 25 and UE supports X GNSS systems, the size of PosSchedulingInfo-r16 is (X+1) and the PosSchedulingInfo-r16 needs to be broadcasted X times, once for each different GNSS.	
PosSchedulingInfo-r16[1] SEQUENCE {		entry 1	
offsetToSI-Used-r16	Not present		
posSI-Periodicity-r16	rf32		
posSI-BroadcastStatus-r16	notBroadcasting		
posSIB-MappingInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16 {	3 entries for Sub-test 25, 1 entry for Sub-tests 20, 21, 23 and 24	PosSibType-n = posSibType1-1, posSibType1-2, posSibType1-3	Sub-test 25
		PosSibType-n = posSibType4-1	Sub-test 24
		PosSibType-n = posSibType5-1	Sub-test 23
		PosSibType-n = posSibType6-1	Sub-test 20 or Sub-test 21

PosSIB-Type-r16[n] SEQUENCE {		entry n	
encrypted-r16	Not present		
gnss-id-r16	Not present		
sbas-id-r16	Not present		
posSibType-r16	PosSibType-n	The posSibType-r16 is depending on the sub–test cases and entry number n	
areaScope-r16	Not present		
}			
}			
}			
PosSchedulingInfo-r16[2] SEQUENCE {		entry 2 If the UE supports X GNSS systems, the PosSchedulingInfo-r16 needs to be broadcasted X times, once for each different GNSS.	Sub-test 25
offsetToSI-Used-r16	Not present		
posSI-Periodicity-r16	rf32		
posSI-BroadcastStatus-r16	notBroadcasting		
posSIB-MappingInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r16 {	6 entries for Sub-test 25	posSibType2-1, posSibType2-3, posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9	
PosSIB-Type-r16[m] SEQUENCE {		entry m	
encrypted-r16	Not present		
gnss-id-r16	Set depending on the GNSS supported by the UE		
sbas-id-r16	Not present		
posSibType-r16	PosSibType-m,	The posSibType-r16 is depending on the entry number m	
areaScope-r16	Not present		
}			
}			
}			
}			
}			

Table 9.4.3.3.3-4: RRCReconfiguration (Preamble, step 7 as defined in TS 38.508-1 [30] Table 4.5.4.2-3)

Derivation Path: TS 38.331 [6], clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier		
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
onDemandSIB-Request-r16 CHOICE SEQUENCE {			
setup SEQUENCE {			
onDemandSIB-RequestProhibitTimer-r16	s5		
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.4.3.3.3-5: DLInformationTransfer (step 2, step 4, step 5 and step 10, Table 9.4.3.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.3.3.3-6	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.3.3.3-6: DL NAS TRANSPORT (DLInformationTransfer, Table 9.4.3.3.3-4)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 2:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 5: Set according to Table 9.4.3.3.3-7	LPP Request Location Information	
	Steps 4 and 10: Set according to Table 9.4.3.3.3-8	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.4.3.3.3-7: LPP Request Location Information (DL NAS TRANSPORT, Table 9.4.3.3.3-5)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsPreferred		

Table 9.4.3.3.3-8: LPP Acknowledgement (DL NAS TRANSPORT, Table 9.4.3.3.3-5)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 3 or 9, Table 9.4.3.3.2-	
}			
lpp-MessageBody	Not present.		
}			

Table 9.4.3.3.3-9: DedicatedSIBRequest (step 6, Table 9.4.3.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-2A			
Information Element	**Value/remark**	**Comment**	**Condition**
DedicatedSIBRequest-r16 ::= SEQUENCE {			
criticalExtensions CHOICE {			
dedicatedSIBRequest-r16 SEQUENCE {			
onDemandSIB-RequestList-r16 SEQUENCE {			
requestedSIB-List-r16	Not checked		
requestedPosSIB-List-r16 SEQUENCE (SIZE (1..maxOnDemandPosSIB-r16)) OF PosSIB-ReqInfo-r16 {	1 entry for Sub-tests 20, 21, 23 and 24; 9 entries for Sub-test 25	The size of PosSIB-ReqInfo-r16 is 1 for Sub-tests 20, 21, 23 and 24. If Sub-test 25 , the size of PosSIB-ReqInfo-r16 is dependent on the number of posSIB the UE needed in the positioning procedures..	
PosSIB-ReqInfo-r16[n] SEQUENCE {		entry n	
gnss-id-r16	Not present		Sub-test 25 posSibType 2-x
	Set depending on the GNSS supported by the UE		Sub-test 25 posSibType 2-x
sbas-id-r16	Not checked		
posSibType-r16	PosSibType-n	Present. Any posSibType for GNSS systems acceptable. PosSibType-n = posSibType1-1, posSibType1-2, posSibType1-3, posSibType2-1, posSibType2-3, posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9	Sub-test 25
		PosSibType-n = posSibType4-1	Sub-test 24
		PosSibType-n = posSibType5-1	Sub-test 23
		PosSibType-n = posSibType6-1	Sub-test 20 or Sub-test 21
}			
}			
}			
}			
}			
}			

Table 9.4.3.3.3-10: ULInformationTransfer (steps 3, 7a and 9, Table 9.4.3.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.3.3.3-11	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.3.3.3-11: UL NAS TRANSPORT (ULInformationTransfer, Table 9.4.3.3.3-10)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 3:** Set according to Table 9.4.3.3.3-12	LPP Provide Capabilities	
	Step 7a: Set according to Table 9.4.3.3.3-13	LPP Request Assistance Data	
	Step 9: Set according to Table 9.4.3.3.3-14	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 2 Table Table 9.4.3.3.2-3)	

Table 9.4.3.3.3-12: LPP Provide Capabilities (UL NAS TRANSPORT, Table 9.4.3.3.3-11)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 12, Table 9.4.1.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities	Rel-14 onwards	
a-gnss-ProvideCapabilities	Dependent on UE capabilities		
sensor-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-16 onwards	
tbs-ProvideCapabilities-r13	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.4.3.3.3-13: LPP Request Assistance Data (UL NAS TRANSPORT, Table 9.4.3.3.3-11)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	targetDevice		
transactionNumber	(0..255)		
}			
endTransaction	FALSE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			

requestAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
requestAssistanceData-r9 SEQUENCE {			
commonIEsRequestAssistanceData	Present or not present		
a-gnss-RequestAssistanceData	Present for sub-test 25	Rel-15 onwards	
otdoa-RequestAssistanceData	Not present		
epdu-RequestAssistanceData	Not present		
sensor-RequestAssistanceData-r14	Present for sub-test 24	Rel-16 onwards	
tbs-RequestAssistanceData-r14	Present for sub-test 23	Rel-16 onwards	
wlan-RequestAssistanceData-r14	Not present		
nr-Multi-RTT-RequestAssistanceData-r16	Not present		
nr-DL-AoD-RequestAssistanceData-r16	Present for sub-test 20	Rel-16 onwards	
nr-DL-TDOA-RequestAssistanceData-r16	Present for sub-test 21	Rel-16 onwards	
}			
}			
}			
}			
}			
}			

Table 9.4.3.3.3-14: LPP Provide Location Information (UL NAS TRANSPORT, Table 9.4.3.3.3-11)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 15, Table 9.4.1.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	May be present. Any value acceptable		
a-gnss-ProvideLocationInformation SEQUENCE {	Present for sub-test 25		
gnss-SignalMeasurementInformation	Present. Any value acceptable		
gnss-LocationInformation	May be present		
gnss-Error	Not present		
}			
sensor-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 24	Rel-16 onwards	
sensor-MeasurementInformation-r13	Present. Any value acceptable		
sensor-Error-r13	Not present		
sensor-MotionInformation-r15	May be present		
}			
tbs-ProvideLocationInformation-r13 SEQUENCE {	Present for sub-test 23	Rel-16 onwards	
tbs-MeasurementInformation-r13	Present. Any value acceptable		
tbs-Error-r13	Not present		
}			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 20	Rel-16 onwards	
nr-DL-AoD-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-DL-AoD-Error-r16	Not present		
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 21	Rel-16 onwards	
nr-DL-TDOA-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-DL-TDOA-Error-r16	Not present		
}			
}			
}			
}			
}			

}			
}			

Table 9.4.3.3.3-15: SystemInformation – Sub-tests 20, 21, 23 and 24 (step 8, Table 9.4.3.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-29 with condition posSIB.

Table 9.4.3.3.3-16: SystemInformation – Sub-test 25, message 1 (step 8, Table 9.4.3.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-29 with condition posSIB and posSib1-x.

Table 9.4.3.3.3-17: SystemInformation – Sub-test 25, message 2 (step 8, Table 9.4.3.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.1-29 with condition posSIB and posSib2-x.

Table 9.4.3.3.3-18: PosSystemInformation-r16-IEs (step 8, Table 9.4.3.3.2-3)

Derivation Path: TS 38.508-1, Table 4.6.2a-1			
Information Element	**Value/remark**	**Comment**	**Condition**
PosSystemInformation-r16-IEs ::= SEQUENCE {			
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	3 entries		Sub-test 25 posSib1-x
posSib1-1-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 1	
posSib1-2-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 2	
posSib1-3-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 3	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	6 entries		Sub-test 25, posSib2-x
posSib2-1-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 1	
posSib2-3-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 2	
posSib2-6-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 3	
posSib2-7-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 4	
posSib2-8-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 5	
posSib2-9-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 6	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	1 entry		Sub-test 24
posSib4-1-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 1	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	1 entry		Sub-test 23
posSib5-1-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 1	
posSIB-TypeAndInfo-r16 SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {	1 entry		Sub-test 20, Sub-test 21
posSib6-1-r16	SIBpos as defined in Table 9.4.3.3.3-19	entry 1	
}			
lateNonCriticalExtension	Not present		
nonCriticalExtension	Not present		
}			

Table 9.4.3.3.3-19: SIBpos (PosSystemInformation-r16-IEs, Table 9.4.3.3.3-18)

Derivation Path: TS 38.508-1, Table 4.6.2a-3			
Information Element	**Value/remark**	**Comment**	**Condition**
SIBpos-r16 ::= SEQUENCE {			
assistanceDataSIB-Element-r16	OCTET STRING containing AssistanceDataSIBelement		
}			

Table 9.4.3.3.3-20: AssistanceDataSIBelement

Derivation Path: TS 37.355, clause 7.4.2			
Information Element	**Value/remark**	**Comment**	**Condition**
AssistanceDataSIBelement-r15 ::= SEQUENCE {			
valueTag-r15	Not present		
expirationTime-r15	Not present		
cipheringKeyData-r15	Not present		
segmentationInfo-r15	Not present		Not present when the posSIB is not segmented
segmentationInfo-r15 SEQUENCE {			Present when the posSIB is segmented
segmentationOption-r15	octet-string-seg		
assistanceDataSegmentType-r15	notLastSegment		Used when posSIB is segmented and the segment is not the last segment
	lastSegment		Used when posSIB is not segmented, or posSIB is segmented and the segment is the last segment
assistanceDataSegmentNumber-r15	index of the segmented posSIB		
}			
assistanceDataElement-r15	OCTET STRING containing LPP IEs (GNSS-ReferenceTime, GNSS-ReferenceLocation, GNSS-IonosphericModel,GNSS-TimeModelList, GNSS-NavigationModel, GNSS-AcquisitionAssistance, GNSS-Almanac, GNSS-UTC-Model, GNSS-AuxiliaryInformation) as defined in TS 37.571-5 [12] and mapped according to the content of posSibType-r16 in Table 9.4.1.3.3-3.		Sub-test 25
	OCTET STRING containing sensor-AssistanceDataList as defined in Table 8.4-1		Sub-test 24
	OCTET STRING containing tbs-AssistanceDataList as defined in Table 8.4-1		Sub-test 23

	OCTET STRING containing NR-DL-PRS-AssistanceData as defined in Table 8.4.1.6-1.		Sub-test 20, Sub-test 21
}			

9.4.4 Pre-configured Measurement Gap Procedures

9.4.4.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE has no assistance data stored and pre-configured positioning measurement gap was
configured with associated ID via RRCReconfiguration message}
    then { UE sends a RRCReconfigurationComplete message to confirm the reception of pre-configured
measurement gap configuration }
}
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE is configured with pre-configured measurement gap and the pre-configured measurement gap
is sufficient for the location measurement and UE receives a location request message}
    then { UE sends a measurement gap activation request using UL MAC CE to activate the positioning
measurement gap}
}
```

(3)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives Positioning Measurement Gap Activation command containing an ID to activate the
associated measurement gap }
    then { UE activates the positioning measurement gap and sends a PROVIDE LOCATION INFORMATION
message containing a location estimate }
}
```

(4)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE stops performing location measurements and the preconfigured positioning measurement gap
is activated}
    then { UE sends a Measurement Gap Deactivation Request to deactivate all the activated
measurement gaps}
}
```

9.4.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.305 clause 7.7.2, TS 38.331 clause 5.5.6.2, TS 38.321 clauses 5.18.20, 5.25, 6.1.3.40 and 6.1.3.41. Unless otherwise stated these are Rel-17 requirements.

[TS 38.305, clause 7.7.2]

The pre-configured measurement gap procedure is used by the network to provide measurement gap for NR DL-PRS measurements. The gNB may activate/deactivate the pre-configurated measurement gap upon receiving the request from a UE or LMF.

…

Figure 7.7.2-1 shows the general positioning procedure for Pre-configured Measurement Gap.

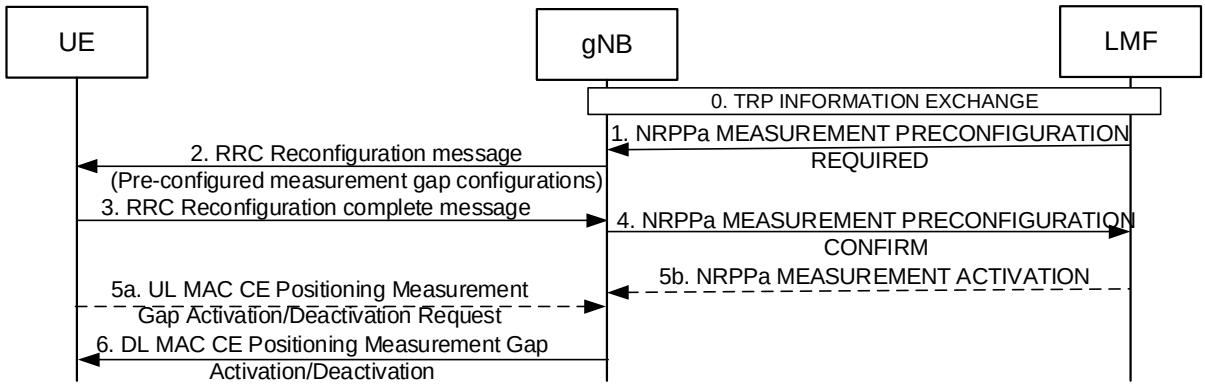

Figure 7.7.2-1: Pre-configured measurement gap configuration procedure

0. LMF obtains the TRP information required for positioning services from the gNBs.

1. The LMF provides the PRS information of the neighbour TRPs to the serving gNB and requests the serving gNBs to pre-configure measurement gap via NRPPa MEASUREMENT PRECONFIGURATION REQUIRED message.

2. Based on the assistance information from the LMF and the UE capability, the serving gNB provides pre-configured measurement gap configuration(s) with associated ID(s) to the UE by sending RRC Reconfiguration message specified in TS 38.331 [14].

3. The UE sends RRC Reconfiguration complete message to the gNB to confirm the reception of pre-configured measurement gap configuration(s).

4. The gNB sends the confirmation message to the LMF to indicate the success of the pre-configuration via NRPPa MEASUREMENT PRECONFIGURATION CONFIRM message.

5a. If the UE requires measurement gaps for performing the requested location measurements, and the triggering condition for UL MAC CE as specified in TS 38.331 [14] is met, the UE sends UL MAC CE Positioning Measurement Gap Activation/Deactivation Request to the gNB and indicates the requested measurement gap configuration based on the ID configured in step 1.

5b. LMF may send the NRPPa MEASUREMENT ACTIVATION message to request for measurement gap activation.

6. Based on the request from the UE in step 5a or the request from the LMF in step 5b, the gNB may send DL MAC CE Positioning Measurement Gap Activation/Deactivation containing an ID to activate/deactivate the associated measurement gap.

[TS 38.331, clause 5.5.6.2]

The UE shall:

1> if and only if upper layers indicate to start performing location measurements towards E-UTRA or NR or start subframe and slot timing detection towards E-UTRA, and the UE requires measurement gaps for these operations while measurement gaps are either not configured or not sufficient:

2> if preconfigured measurement gaps for positioning are configured and the UE considers that at least one of the preconfigured measurement gaps for positioning is sufficient for the location measurement when activated:

3> trigger the lower layers to initiate the measurement gap activation request using UL MAC CE as specified in TS 38.321 [3];

2> else:

3> initiate the procedure to indicate start as specified in clause 5.5.6.3;

NOTE 1: The UE verifies the measurement gap situation only upon receiving the indication from upper layers. If at this point in time sufficient gaps are available, the UE does not initiate the procedure. Unless it receives a new indication from upper layers, the UE is only allowed to further repeat the procedure in the same PCell once per frequency of the target RAT if the provided measurement gaps are insufficient.

NOTE 1a: When indication is received from upper layers for performing location measurement and there is pre-configured measurement gap configured (not preconfigured measurement gap for positioning), the UE considers this preconfigured measurement gap to be not sufficient if the measurement gap is not considered to be always activated according to clause 9.1.7.2 of TS 38.133 [14].

1> if and only if upper layers indicate to stop performing location measurements towards E-UTRA or NR or stop subframe and slot timing detection towards E-UTRA:

2> if there is no activated preconfigured measurement gap for positioning:

3> if there is previously triggered UL MAC CE transmission for the measurement gap activation for positioning:

4> indicate to the lower layers to cancel the triggered UL MAC CE transmission for the measurement gap activation as specified in TS 38.321 [3];

3> else:

4> initiate the procedure to indicate stop as specified in 5.5.6.3.

2> else if there is activated preconfigured measurement gap for positioning:

3> trigger the lower layers to deactivate all the activated measurement gap(s) for positioning as specified in TS 38.321 [3].

NOTE 2: The UE may initiate the procedure to indicate stop even if it did not previously initiate the procedure to indicate start.

[TS 38.321, clause 5.18.20]

If the UE is configured with pre-configured measurement gaps, the network may send DL MAC CE for Positioning Measurement Gap Activation/Deactivation Command to the UE as in clause 6.1.3.41. For the activated measurement gap, the UE shall follow the specified UE behaviour in clause 5.14.

Upon the reception of the MAC CE for Positioning Measurement Gap Activation/Deactivation Command, the MAC entity shall:

1> if the Measurement Gap Activation/Deactivation Command MAC CE indicates the deactivation of a pre-configured positioning measurement gap:

2> deactivate the positioning measurement gap.

1> else if the Positioning Measurement Gap Activation/Deactivation Command MAC CE indicates the activation of a pre-configured measurement gap:

2> activate the positioning measurement gap and perform the procedure specified in clause 5.14.

[TS 38.321, clause 5.25]

If the UE is configured with pre-configured measurement gap, the UE may request the network to activate or deactivate the Positioning measurement gap with UL MAC CE for Positioning Measurement Gap Activation/Deactivation Request in clause 6.1.3.40.

The MAC entity shall, when triggered by the upper layer to send Positioning Measurement Gap Activation/Deactivation Request, cancel the triggered Positioning Measurement Gap Activation/Deactivation Request, if any and trigger another Positioning Measurement Gap Activation/Deactivation Request according to the upper layer's request.

The MAC entity shall,

1>if Positioning Measurement Gap Activation/Deactivation Request MAC CE has been triggered, and not cancelled:

2> if indication from upper layer has been received that the triggered Positioning Measurement Gap Activation/Deactivation Request MAC CE should be cancelled; or

2> if the pre-configured measurement gap indicated in the Positioning Measurement Gap Activation/Deactivation Request MAC CE has already been activated/deactivated according to clause 5.18.20:

3> cancel the triggered Positioning Measurement Gap Activation/Deactivation Request MAC CE.

2> if UL-SCH resources are available for a new transmission and these UL-SCH resources can accommodate the Positioning Measurement Gap Activation/Deactivation Request MAC CE plus its subheader as a result of logical channel prioritization:

3> instruct the Multiplexing and Assembly procedure to generate the Positioning Measurement Gap Activation/Deactivation Request MAC CE according to the upper layer's request;

3> cancel triggered Positioning Measurement Gap Activation/Deactivation Request MAC CE.

2> else:

3> trigger a Scheduling Request for Positioning Measurement Gap Activation/Deactivation Request MAC CE.

[TS 38.321, clause 6.1.3.40]

The Positioning Measurement Gap Activation/deactivation request MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-2b.

It has a fixed 8-bit size defined as follows (Figure 6.1.3.40-1):

- Positioning MG ID: This field indicates the identifier for the pre-configured positioning measurement gap. The length of the field is 4 bits;
- A/D: This field indicates the activation or deactivation of the Positioning Measurement Gap. The field is set to 1 to indicate activation, otherwise it indicates deactivation. The length of the field is 1 bit;
- R: Reserved bit, set to 0.

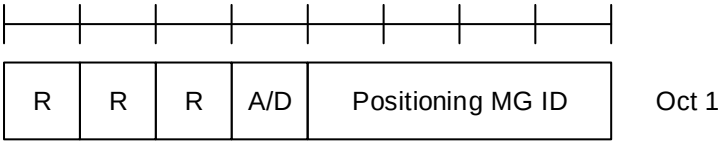

Figure 6.1.3.40-1: Positioning Measurement Gap Activation/Deactivation Request MAC CE

[TS 38.321, clause 6.1.3.41]

The Positioning Measurement Gap Activation/Deactivation Command MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-1b.

It has a fixed 8-bit size defined as follows (Figure 6.1.3.41-1):

- Positioning MG ID: This field indicates the identifier for the preconfigured positioning measurement gap. The length of the field is 4 bits;
- A/D: This field indicates the activation or deactivation of the Positioning Measurement Gap. The field is set to 1 to indicate activation, otherwise it indicates deactivation. The length of the field is 1 bit;
- R: Reserved bit, set to 0.

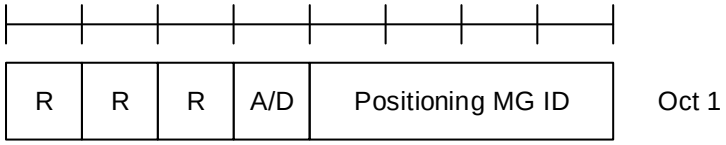

Figure 6.1.3.41-1: Positioning Measurement Gap Activation/Deactivation Command MAC CE

9.4.4.3 Test description

9.4.4.3.1 Pre-test conditions

System Simulator:

- Sub-test 26: NR Cell 1 as specified in 8.2.9
- Sub-test 27: NR Cell 1 and NR Cell 2 as specified in 8.2.10.
- Sub-test 28: NR Cell 1, NR Cell 2 and NR Cell 3 as specified in 8.2.11.

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- Then the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE to clear the stored assistance data in the UE.

Related PICS/PIXIT Statements:

-

9.4.4.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a sub-test case number as defined in Table 9.4.4.3.2-1 below:

Table 9.4.4.3.2-1: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
26	UE supporting Multi-RTT (Rel-17 onwards)
27	UE supporting DL-AoD (Rel-17 onwards)
28	UE supporting DL-TDOA (Rel-17 onwards)

Table 9.4.4.3.2-2: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
B	NG-RAN NR	

Table 9.4.4.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends an LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
3	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4	The SS sends an LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
5	The SS sends an RRCReconfiguration message to configure pre-configured positioning measurement gap with associated ID.	<--	RRCReconfiguration		
6	Check: Does the UE send an RRCReconfigurationComplete message to confirm the reception of pre-configured measurement gap configuration?	-->	RRCReconfigurationComplete	1	P
7	The SS sends an LPP message of type Request Location Information including a request for location estimate and location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
8	Check: Does the UE send a measurement gap activation request using UL MAC CE containing the measurement gap ID to activate the positioning measurement gap?	-->	MAC CE (Positioning Measurement Gap Activation Request)	2	P
9	The SS sends a Positioning Measurement Gap Activation command containing an ID to activate the associated measurement gap	<--	MAC CE (Positioning Measurement Gap Activation Command)		
-	EXCEPTION: In parallel with the events described in Steps 10 to 11, the step specified in Table 9.4.4.3.2-4 takes place.				
10	Check: Does the UE send an LPP message of type Provide Location Information including location estimate or location measurements?	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	3	P
11	IF the UE LPP message at step 10 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

Table 9.4.4.3.2-4: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE send a Measurement Gap Deactivation Request to deactivate the activated measurement gap?	-->	MAC CE (Positioning Measurement Gap Deactivation Request)	4	P

9.4.4.3.3 Specific message contents

Table 9.4.4.3.3-1: RESET UE POSITIONING STORED INFORMATION (Preamble)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**

UE Positioning Technology	Sub-test 26: 0 0 0 0 0 1 1 0 Sub-test 27: 0 0 0 0 1 0 0 0 Sub-test 28: 0 0 0 0 0 1 1 1	Sub-test 26: Multi-RTT Sub-test 27: DL-AoD Sub-test 28: DL-TDOA	

Table 9.4.4.3.3-2: DLInformationTransfer (step 1, step 3, step 4, step 7 and step 11, Table 9.4.4.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.4.3.3-3	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.4.3.3-3: DL NAS TRANSPORT (DLInformationTransfer, Table 9.4.4.3.3-2)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Steps 3 and 11: Set according to Table 9.4.4.3.3-4	LPP Acknowledgement	
	Step 4: Set according to Table 9.4.4.3.3-5	LPP Provide Assistance Data	
	Step 7: Set according to Table 9.4.4.3.3-6	LPP Request Location Information	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.4.4.3.3-4: LPP Acknowledgement (DL NAS TRANSPORT, Table 9.4.4.3.3-3)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		

sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in steps 2 or 10, Table 9.4.4.3.2-3	
}			
lpp-MessageBody	Not present.		
}			

Table 9.4.4.3.3-5: LPP Provide Assistance data (DL NAS TRANSPORT, Table 9.4.4.3.3-3)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			

Table 9.4.4.3.3-6: LPP Request Location Information (DL NAS TRANSPORT, Table 9.4.4.3.3-3)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsPreferred		

Table 9.4.4.3.3-7: RRCReconfiguration (step 5, Table 9.4.4.3.2-3)

Derivation Path: TS 38.331 [6], clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier		
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
radioBearerConfig	Not present		
secondaryCellGroup	Not present		
measConfig SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	Not present		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
s-MeasureConfig	Not present		
quantityConfig	Not present		
measGapConfig SEQUENCE {			
gapFR2	Not present		
gapFR1	Not present		
gapUE	Not present		
gapToAddModList-r17	Not present		
gapToReleaseList-r17	Not present		
posMeasGapPreConfigToAddModList-r17 SEQUENCE (SIZE (1..maxNrofPreConfigPosGapId-r17)) OF PosGapConfig-r17 {	2 entries		
PosGapConfig-r17[1] SEQUENCE {		entry 1	
measPosPreConfigGapId-r17	1		
gapOffset-r17	0		
mgl-r17	ms6		
mgrp-r17	ms40		
mgta-r17	ms0		
gapType-r17	perFR1		
}			
PosGapConfig-r17[2] SEQUENCE {		entry 2	
measPosPreConfigGapId-r17	2		
gapOffset-r17	0		
mgl-r17	ms5dot5		
mgrp-r17	ms40		
mgta-r17	ms0		
gapType-r17	perFR2		
}			
}			
posMeasGapPreConfigToReleaseList-r17	Not present		
}			
measGapSharingConfig	Not present		
interFrequencyConfig-NoGap-r16	Not present		
}			
lateNonCriticalExtension	Not present		
nonCriticalExtension	Not present		
}			
}			
}			

Table 9.4.4.3.3-8: ULInformationTransfer (step 2 and step 10, Table 9.4.4.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.4.3.3-9	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.4.3.3-9: UL NAS TRANSPORT (ULInformationTransfer, Table 9.4.4.3.3-8)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 2:** Set according to Table 9.4.4.3.3-10	LPP Provide Capabilities	
	Step 10: Set according to Table 9.4.4.3.3-11	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 9.4.4.3.2-3)	

Table 9.4.4.3.3-10: LPP Provide Capabilities (UL NAS TRANSPORT, Table 9.4.4.3.3-9)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 9.4.4.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities		
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities		
}			
}			
}			
}			
}			
}			

Table 9.4.4.3.3-11: LPP Provide Location Information (UL NAS TRANSPORT, Table 9.4.4.3.3-8)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 7, Table 9.4.4.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	May be present. Any value acceptable		
nr-Multi-RTT-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 26	Rel-17 onwards	
nr-Multi-RTT-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-Multi-RTT-Error-r16	Not present		
nr-Multi-RTT-SignalMeasurementInstances-r17	Not present		
}			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 27	Rel-17 onwards	
nr-DL-AoD-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-AoD-LocationInformation-r16	Not checked		
nr-DL-AoD-Error-r16	Not present		
nr-DL-AoD-SignalMeasurementInstances-r17	Not present		
nr-DL-AoD-LocationInformationInstances-r17	Not present		
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 28	Rel-17 onwards	
nr-DL-TDOA-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-tdoa-LocationInformation-r16	Not checked		
nr-DL-TDOA-Error-r16	Not present		
nr-DL-TDOA-SignalMeasurementInstances-r17	Not present		
nr-DL-TDOA-LocationInformationInstances-r17	Not present		
}			
}			
}			
}			
}			
}			
}			

9.4.5 Pre-configured PRS processing window procedures

9.4.5.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE has no assistance data stored and PRS processing window was configured with associated
ID via RRCReconfiguration message}
    then { the UE sends a RRCReconfigurationComplete message to confirm the reception of pre-
configured PRS processing window configuration }
}
```

(2)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE was configured with PRS processing window and receives PPW Activation Command and then
UE receives a location request from LMF }
    then { the UE sends a PROVIDE LOCATION INFORMATION message containing a location estimate }
}
```

9.4.5.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.305 clause 7.8, TS 38.321 clauses 5.18.21, 5.24 and 6.1.3.42, TS 38.214 clause 5.1.6.5 and TS 38.133 clause 9.9.1.2. Unless otherwise stated these are Rel-17 requirements.

[TS 38.305, clause 7.8]

The pre-configured PRS processing window procedure is used by the network to provide PRS processing window for NR DL-PRS measurements to the UE without measurement gap. The gNB may activate the pre-configurated PRS processing window upon receiving the request from LMF.

…

Figure 7.8.2-1 shows the general positioning procedure for Pre-configured PRS processing window.

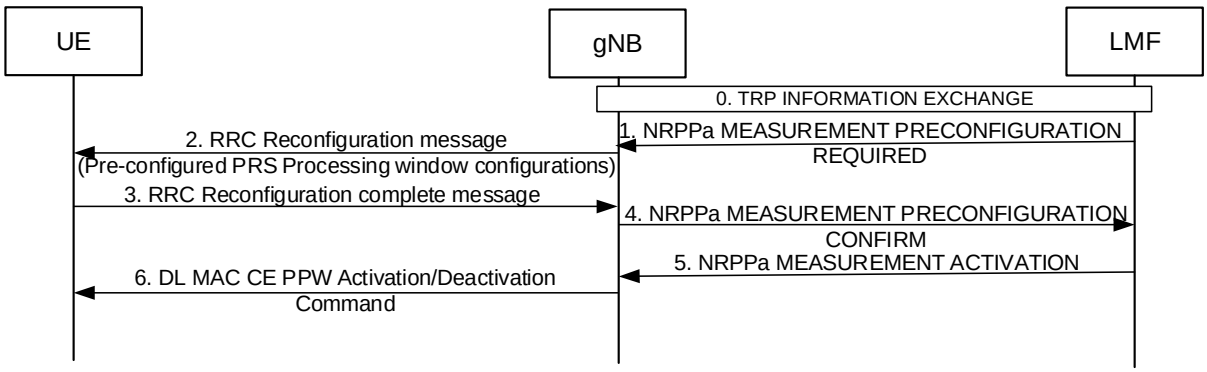

Figure 7.8.2-1: Pre-configured PRS processing window configuration procedure

0. LMF obtains the TRP information required for positioning services from the gNBs.
1. The LMF provides the PRS information of the neighbour TRPs to the serving gNB and requests the serving gNBs to pre-configure PRS processing window configuration(s) via NRPPa MEASUREMENT PRECONFIGURATION REQUIRED message.

2. Based on the assistance information from the LMF and the UE capability, the serving gNB provides pre-configured PRS processing window configuration(s) with associated ID(s) to the UE by sending RRC Reconfiguration message specified in TS 38.331 [14].

3. The UE sends RRC Reconfiguration complete message to the gNB to confirm the reception of pre-configured PRS processing window configuration(s).

4. The gNB sends the confirmation message to the LMF to indicate the success of the pre-configuration via NRPPa MEASUREMENT PRECONFIGURATION CONFIRM message.

5. The LMF sends the NRPPa MEASUREMENT ACTIVATION message to request the gNB to (de)activate the preconfigured PRS processing window.

6. Based on the request from the LMF in step 5, the gNB sends DL MAC CE PPW Activation/Deactivation Command containing an ID to activate/deactivate the associated PRS processing window.

[TS 38.321, clause 5.18.21]

If the UE is configured with pre-configured PPW, the network may send DL MAC CE for PPW Activation/Deactivation Command to the UE as in clause 6.1.3.42. For the activated PPW, the UE shall follow the specified UE behaviour in clause 5.24.

Upon activation of DL BWP, the PPW(s) configured for that BWP are considered deactivated. Upon reconfiguration of PPW(s) of the active DL BWP, all the PPW(s) for that BWP are considered deactivated.

Upon the reception of the MAC CE for PPW Activation/Deactivation Command, the MAC entity shall:

1> if the DL MAC CE for PPW Activation/Deactivation Command indicates the deactivation of a pre-configured PPW:

2> deactivate the PPW.

1> else if the DL MAC CE for PPW Activation/Deactivation Command indicates the activation of a pre-configured PPW:

2> activate the PPW according to the procedure specified in clause 5.24.

[TS 38.321, clause 6.1.3.42]

The PPW Activation/Deactivation Command MAC CE is identified by MAC subheader with eLCID as specified in Table 6.2.1-1b.

It has variable size defined as follows (Figure 6.1.3.42-1):

- numEntry: This field indicates the number of entries N-1 in the MAC CE. 00 indicates that N equals to 2; 01 indicates that N equals to 3 and so on. The length of the field is 2 bits;

- Serving Cell ID: This field indicates the identity of the Serving Cell for which the MAC CE applies. The length of the field is 5 bits;

- PPW ID: This field indicates the index of the PPW configured on active DL BWP of the Serving Cell identified by the above Serving Cell ID. Index 0 corresponds to the first entry within the list of the PPW configuration by the increasing order of *PPW-ID* in TS 38.331 [5] in this BWP, index 1 corresponds to the second entry in the list and so on. The length of the field is 2 bits;

- A/D: This field indicates the activation or deactivation of the PPW. The field is set to 1 to indicate activation, otherwise it indicates deactivation. The length of the field is 1 bit;

- R: Reserved bit, set to 0.

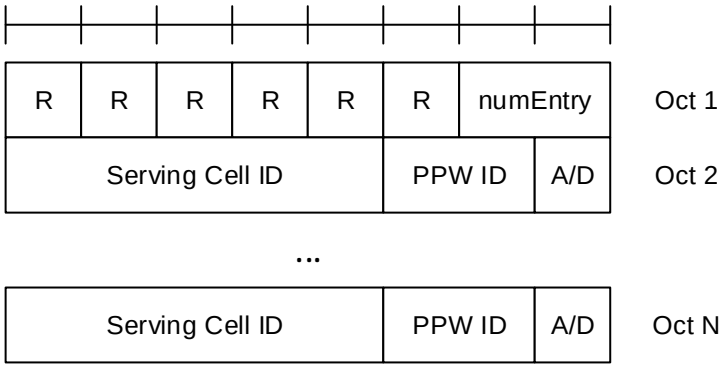

Figure 6.1.3.42-1: PPW Activation/Deactivation Command MAC CE

[TS 38.321, clause 5.24]

When PPW is activated and PRS has higher priority than DL channel and signals, for the affected symbols within the PPW according to clause 5.1.6.5 in TS 38.214 [7], the MAC entity shall:

1> if the *ra-ResponseWindow* or the *ra-ContentionResolutionTimer* or the *msgB-ResponseWindow* is running:

2> monitor the PDCCH as specified in clauses 5.1.4 and 5.1.5.

1> else:

2> not receive DL-SCH;

2> not receive PDCCH.

[TS 38.214, clause 5.1.6.5]

The UE is expected to measure the DL PRS outside the measurement gap, subject to UE capability, if the DL PRS is inside the active DL BWP and has the same numerology as the active DL BWP and is within the DL PRS processing window indicated by higher layer parameter *DL-PPW-PreConfig*. The UE is not expected to measure the DL PRS outside the measurement gap if the expected received timing difference between the DL PRS from the non-serving cell and that from the serving cell, determined by the higher layer parameters *nr-DL-PRS-ExpectedRSTD* and *nr-DL-PRS-ExpectedRSTD-Uncertainty*, is larger than maximum Rx timing difference provided by UE capability. For receiving the DL PRS outside the measurement gap and within the DL PRS processing window, the UE determines the DL PRS priority as indicated by higher layer parameter *priority* subject to UE capability or as implied by UE capability:

- with value *'st1'* where the DL PRS is higher priority than all the DL signal/channels except SSB, or
- with value *'st2'* where the DL PRS is lower priority than PDCCH and the PDSCH scheduled by DCI formats 1_1 or 1_2 with the priority indicator field in the corresponding DCI format set to 1, and is higher priority than other DL signals/channels except SSB, or
- with value *'st3'* where the DL PRS is lower priority than all the DL signals/channels except SSB.

Inside one *DL-PPW-PreConfig* the UE is only expected to measure a single DL PRS positioning frequency layer.

When the UE is expected to measure the DL PRS outside the measurement gap in a configured PRS processing window with *type1A* and if the DL PRS is determined to be higher priority than the DL signals and channels inside the PRS processing window, those DL signals and channels are not expected to be measured by the UE. When the UE is expected to measure the DL PRS outside the measurement gap in a configured PRS processing window with *type1B* and if the DL PRS is determined to be higher priority than the DL signals and channels inside the PRS processing window, those DL signals and channels in the same band as the DL PRS are not expected to be measured by the UE. When the UE is expected to measure the DL PRS outside the measurement gap in a configured PRS processing window with *type2* if the DL PRS is determined to be higher priority than the DL signals and channels inside the PRS processing window, those DL signals and channels from the impacted serving cells are not expected to be measured by the UE on the overlapped symbols with the DL PRS, where impacted serving cells refer to the serving cell on which the *DL-PPW-PreConfig* is configured for a frequency range 1 band, and all the serving cells in the same band as the DL PRS for a frequency range 2 band.

…

For a UE configured with PRS Processing Window(s), when the UE receives an activation/deactivation command, as described in clause 6.1.3.42 of [10, TS 38.321], for a PRS processing window activation, and when the UE would transmit a PUCCH with HARQ-ACK information in slot n corresponding to the PDSCH carrying the command, the corresponding actions in [10, TS 38.321] and the UE assumptions shall be applied starting from the first slot that is after slot $n + 3N_{slot}^{subframe,\mu}$ where μ is the SCS configuration for the PUCCH. The UE is not expected to be indicated with more than 4 activated PRS processing windows by higher layer parameter *DL-PPW-PreConfig* across all active DL BWPs and is not expected to be indicated with the activated PRS processing windows *DL-PPW-PreConfig* that overlap in time.

[TS 38.133, clause 9.9.1.2]

The requirements for RSTD, PRS-RSRP, UE Rx-Tx time difference, and PRS-RSRPP measurement without measurement gaps specified in clauses 9.9.2.7, 9.9.3.6, 9.9.4.6 and 9.9.6.6 shall apply provided that:

UE is configured with PPW,

No active BWP switching occurs during PPW,

PRS is within PPW and does not overlap with other signals/channels of higher priority,

- for PPW type 1A/1B, the PPW does not overlap with any symbol for SSB-based RLM/BFD/CBD/L1-RSRP/L1-SINR measurement on any CC or for SSB based RRM measurement on any MOs that are measured outside measurement gaps,
- for PPW type 2, PRS does not overlap with any symbol for SSB-based RLM/BFD/CBD/L1-RSRP/L1-SINR measurement on any CC or for SSB based RRM measurement on any MOs that are measured outside measurement gaps,

max $|\Delta T| \leq$ THR, where

ΔT is the time difference between the start of a slot containing PRS from the neighbour cell/TRP and the start of the closest slot from the serving cell;

the range of ΔT is determined by the expected RSTD and expected RSTD uncertainty in the assistance data;

THR is the threshold as reported in UE capability *prs-MeasurementWithoutMG-r17*.

SCS of PRS within PPW and SCS of DL active BWP are the same.

9.4.5.3 Test description

9.4.5.3.1 Pre-test conditions

System Simulator:

- Sub-test 26: NR Cell 1 as specified in 8.2.9
- Sub-test 27: NR Cell 1 and NR Cell 2 as specified in 8.2.10.
- Sub-test 28: NR Cell 1, NR Cell 2 and NR Cell 3 as specified in 8.2.11.

UE:

- The UE shall begin the test with no assistance data stored.

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.
- Then the SS sends the RESET UE POSITIONING STORED INFORMATION message to the UE to clear the stored assistance data in the UE.

Related PICS/PIXIT Statements:

-

9.4.5.3.2 Test procedure sequence

This test case includes sub-test cases dependent on the positioning method(s) supported by the UE. Each sub-test case is identified by a sub-test case number as defined in Table 9.4.5.3.2-1 below:

Table 9.4.5.3.2-1: Sub-test case numbers

Sub-Test Case Number	Supported Positioning Methods
26	UE supporting Multi-RTT (Rel-17 onwards)
27	UE supporting DL-AoD (Rel-17 onwards)
28	UE supporting DL-TDOA (Rel-17 onwards)

Table 9.4.5.3.2-2: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
B	NG-RAN NR	

Table 9.4.5.3.2-3: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends an LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends an LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
3	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4	The SS sends an LPP message of type Provide Assistance Data.	<--	*DLInformationTransfer* (LPP PROVIDE ASSISTANCE DATA)	-	-
5	The SS sends an RRCReconfiguration message to configure PRS processing window with associated ID.	<--	RRCReconfiguration		
6	Check: Does the UE send an RRCReconfigurationComplete message to confirm the reception of pre-configured PRS processing window configuration?	-->	RRCReconfigurationComplete	1	P
7	The SS sends a PPW Activation Command containing a PPW ID to activate the associated PRS processing window.	<--	MAC CE (PPW Activation Command)		
8	The SS sends an LPP message of type Request Location Information including a request for location estimate and location measurements.	<--	*DLInformationTransfer* (LPP REQUEST LOCATION INFORMATION)	-	-
9	Check: Does the UE send an LPP message of type Provide Location Information including location estimate or location measurements?	-->	*ULInformationTransfer* (LPP PROVIDE LOCATION INFORMATION)	2	P
10	IF the UE LPP message at step 9 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-

9.4.5.3.3 Specific message contents

Table 9.4.5.3.3-1: RESET UE POSITIONING STORED INFORMATION (Preamble)

Derivation Path: 38.509 clause 6.6			
Information Element	**Value/remark**	**Comment**	**Condition**
UE Positioning Technology	Sub-test 26: 0 0 0 0 0 1 1 0 Sub-test 27: 0 0 0 0 1 0 0 0 Sub-test 28: 0 0 0 0 0 1 1 1	Sub-test 26: Multi-RTT Sub-test 27: DL-AoD Sub-test 28: DL-TDOA	

Table 9.4.5.3.3-2: DLInformationTransfer (step 1, step 3, step 4, step 8 and step 10, Table 9.4.5.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.5.3.3-3	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.5.3.3-3: DL NAS TRANSPORT (DLInformationTransfer, Table 9.4.5.3.3-2)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Steps 3 and 10: Set according to Table 9.4.5.3.3-4	LPP Acknowledgement	
	Step 4: Set according to Table 9.4.5.3.3-5	LPP Provide Assistance Data	
	Step 8: Set according to Table 9.4.5.3.3-7	LPP Request Location Information	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.4.5.3.3-4: LPP Acknowledgement (DL NAS TRANSPORT, Table 9.4.5.3.3-3)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in steps 2 or 9, Table 9.4.5.3.2-3	
}			
lpp-MessageBody	Not present.		
}			

Table 9.4.5.3.3-5: LPP Provide Assistance data (DL NAS TRANSPORT, Table 9.4.5.3.3-3)

Derivation Path: Table 8.4-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-1 with the following exceptions:			
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideAssistanceData SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideAssistanceData-r9 SEQUENCE {			
nr-Multi-RTT-ProvideAssistanceData-r16 SEQUENCE {			
nr-DL-PRS-AssistanceData-r16	As defined in Table 9.4.5.3.3-6		Sub-test 26
}			
nr-DL-AoD-ProvideAssistanceData-r16 SEQUENCE {			
nr-DL-PRS-AssistanceData-r16	As defined in Table 9.4.5.3.3-6		Sub-test 27
}			
nr-DL-TDOA-ProvideAssistanceData-r16 SEQUENCE {			
nr-DL-PRS-AssistanceData-r16	As defined in Table 9.4.5.3.3-6		Sub-test 28
}			
}			
}			
}			
}			
}			
}			

Table 9.4.5.3.3-6: NR-DL-PRS-AssistanceData

Derivation Path: Table 8.4.1.6-1			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4.1.6-1 with the following exceptions:			
NR-DL-PRS-AssistanceData-r16 ::= SEQUENCE {			
nr-DL-PRS-AssistanceDataList-r16 SEQUENCE (SIZE (1..nrMaxFreqLayers-r16)) OF NR-DL-PRS-AssistanceDataPerFreq-r16 {	2 entries		
NR-DL-PRS-AssistanceDataPerFreq-r16[1] SEQUENCE {		entry 1	
nr-DL-PRS-AssistanceDataPerFreq-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF NR-DL-PRS-AssistanceDataPerTRP-r16{	2 entries		
NR-DL-PRS-AssistanceDataPerTRP-r16[1] SEQUENCE {		entry 1	
nr-DL-PRS-ExpectedRSTD-r16	0		
nr-DL-PRS-ExpectedRSTD-Uncertainty-r16	0		
}			
NR-DL-PRS-AssistanceDataPerTRP-r16[2] SEQUENCE {		entry 2	Sub-test 27, Sub-test 28
nr-DL-PRS-ExpectedRSTD-r16	0		
nr-DL-PRS-ExpectedRSTD-Uncertainty-r16	0		
}			
}			
}			
NR-DL-PRS-AssistanceDataPerFreq-r16[2] SEQUENCE {		entry 2	Sub-test 28
nr-DL-PRS-AssistanceDataPerFreq-r16 SEQUENCE (SIZE (1..nrMaxTRPsPerFreq-r16)) OF NR-DL-PRS-AssistanceDataPerTRP-r16{	1 entry		
NR-DL-PRS-AssistanceDataPerTRP-r16[1] SEQUENCE {		entry 1	
nr-DL-PRS-ExpectedRSTD-r16	0		
nr-DL-PRS-ExpectedRSTD-Uncertainty-r16	0		
}			
}			
}			
}			
}			

Table 9.4.5.3.3-7: LPP Request Location Information (DL NAS TRANSPORT, Table 9.4.5.3.3-3)

Derivation Path: Table 8.4-3			
Information Element	**Value/remark**	**Comment**	**Condition**
As defined in Table 8.4-3 with the following exceptions:			
locationInformationType	locationMeasurementsPreferred		

Table 9.4.5.3.3-8: RRCReconfiguration (step 5, Table 9.4.5.3.2-3)

Derivation Path: TS 38.508-1 [30], table 4.6.1-13			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier		
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
nonCriticalExtension SEQUENCE {			
masterCellGroup	OCTET STRING (CONTAINING CellGroupConfig)		
}			
}			
}			
}			

Table 9.4.5.3.3-9: *CellGroupConfig* (RRCReconfiguration, Table 9.4.5.3.3-8)

Derivation Path: 38.508-1 [30], Table 4.6.3-19			
Information Element	**Value/remark**	**Comment**	**Condition**
CellGroupConfig ::= SEQUENCE {			
spCellConfig SEQUENCE {			
spCellConfigDedicated SEQUENCE {			
initialDownlinkBWP SEQUENCE {			
dl-PPW-PreConfigToAddModList-r17 SEQUENCE (SIZE (1..maxNrofPPW-Config-r17)) OF DL-PPW-PreConfig-r17 {	1 entry		
DL-PPW-PreConfig-r17[1] SEQUENCE {		entry 1	
dl-PPW-ID-r17	0		
dl-PPW-PeriodicityAndStartSlot-r17	The periodicity is 160ms and the starting slot offset is 11 ms for any SCS configuration		
length-r17	The length of DL-PRS processing window is 11 ms for any SCS configuration		
type-r17	type1A or type1B or type2	Set depending on UE capabilities. Set to any supported type when UE supporting multiple PPW types	
priority-r17	st1		
}			
}			
}			
}			
}			
}			

Table 9.4.5.3.3-10: ULInformationTransfer (step 2 and step 9, Table 9.4.5.3.2-3)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.5.3.3-11	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.5.3.3-11: UL NAS TRANSPORT (ULInformationTransfer, Table 9.4.5.3.3-10)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 2:** Set according to Table 9.4.5.3.3-12	LPP Provide Capabilities	
	Step 9: Set according to Table 9.4.5.3.3-13	LPP Provide Location Information	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 9.4.5.3.2-3)	

Table 9.4.5.3.3-12: LPP Provide Capabilities (UL NAS TRANSPORT, Table 9.4.5.3.3-11)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 9.4.5.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
commonIEsProvideCapabilities	Dependent on UE capabilities		
nr-Multi-RTT-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-AoD-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-DL-TDOA-ProvideCapabilities-r16	Dependent on UE capabilities		
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities		
}			
}			
}			
}			
}			
}			

Table 9.4.5.3.3-13: LPP Provide Location Information (UL NAS TRANSPORT, Table 9.4.5.3.3-11)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in LPP Request Location Information message in step 8, Table 9.4.5.3.2-3	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideLocationInformation SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideLocationInformation-r9 SEQUENCE {			
commonIEsProvideLocationInformation	May be present. Any value acceptable		
nr-Multi-RTT-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 26	Rel-17 onwards	
nr-Multi-RTT-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-Multi-RTT-Error-r16	Not present		
nr-Multi-RTT-SignalMeasurementInstances-r17	Not present		
}			
nr-DL-AoD-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 27	Rel-17 onwards	
nr-DL-AoD-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-AoD-LocationInformation-r16	Not checked		
nr-DL-AoD-Error-r16	Not present		
nr-DL-AoD-SignalMeasurementInstances-r17	Not present		
nr-DL-AoD-LocationInformationInstances-r17	Not present		
}			
nr-DL-TDOA-ProvideLocationInformation-r16 SEQUENCE {	Present for sub-test 28	Rel-17 onwards	
nr-DL-TDOA-SignalMeasurementInformation-r16	Present. Any value acceptable		
nr-dl-tdoa-LocationInformation-r16	Not checked		
nr-DL-TDOA-Error-r16	Not present		
nr-DL-TDOA-SignalMeasurementInstances-r17	Not present		
nr-DL-TDOA-LocationInformationInstances-r17	Not present		
}			
}			
}			
}			
}			
}			
}			

9.4.6 UE Positioning Assistance Information

9.4.6.1 Test Purpose (TP)

(1)

```
with { a NAS signalling connection existing }
ensure that {
  when { UE receives RRCReconfiguration message requesting the association information of UL SRS
resources for positioning with Tx TEGs }
    then { the UE sends a UEPositioningAssistanceInfo message including TxTEG information }
}
```

9.4.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 38.305 clause 7.4.1.2 and TS 38.331 clause 5.7.14. Unless otherwise stated these are Rel-17 requirements.

[TS 38.305, clause 7.4.1.2]

The UE Positioning Assistance Information procedure is used by UE to report the UE Positioning Assistance Information for UL-TDOA. The UE reports the association between UL-SRS resources for positioning and the UE Tx TEG ID.

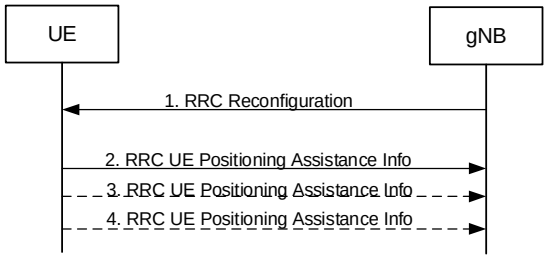

Figure 7.4.1.2-1: RRC procedure for UE TxTEG

Precondition: The serving gNB of a UE has received a NRPPa message from an LMF requesting the TxTEG of the UE for NR UL-TDOA positioning.

1. The serving gNB may send a RRC Reconfiguration message to the UE, requesting the UE to provide the association information of UL SRS resources for positioning with Tx TEGs to the serving gNB if the UE supports UE Tx TEG reporting. Based on the request from the LMF, the RRC Reconfiguration message from the serving gNB to the UE indicates the UE should provide either a single report or a periodic report of UE TxTEG association to the serving gNB.

2. When the UE receives the request via RRC Reconfiguration message, the UE sends a UE Positioning Assistance Info message to the serving gNB to report the UE TxTEG information, including all the changes of the UE TxTEG during the report period if the UE is required to report UE Tx TEG periodically. The UE will report all the UE TxTEG at the time when the RRC Reconfiguration message is received if the UE is only required to report the one-shot UE TxTEG information.

[TS 38.331, clause 5.7.14]

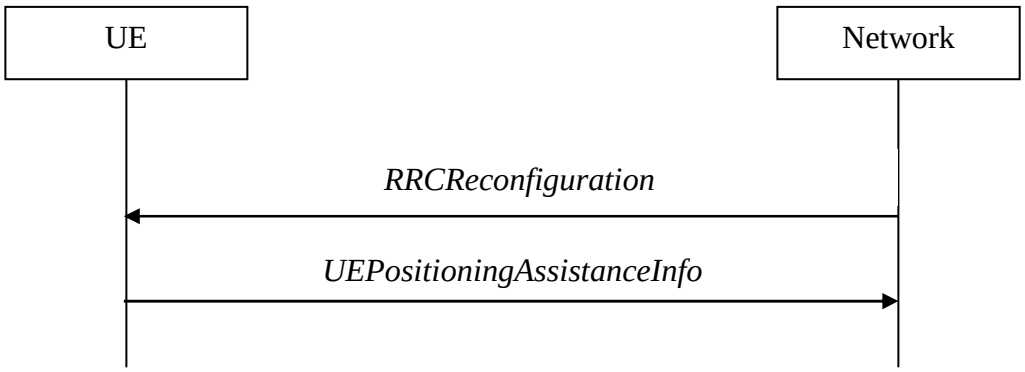

Figure 5.7.14.1-1: UE Positioning Assistance Information procedure

The UE Positioning Assistance Information procedure is used by UE to report the UE Positioning Assistance Information. The UE reports the association between UL-SRS resources for positioning and the UE Tx TEG ID as defined in TS 38.305 [73].

[TS 38.331, clause 5.7.14.2]

A UE capable of providing the association between UL SRS Resource for positioning and UE Tx TEG ID in RRC_CONNECTED may initiate the procedure upon being configured to provide this association information.

Upon initiation of the procedure, the UE shall:

1> initiate transmission of the *UEPositioningAssistanceInfo* message in accordance with 5.7.14.3 to provide the association.

[TS 38.331, clause 5.7.14.3]

The UE shall set the contents of the *UEPositioningAssistanceInfo* message as follows:

1> if *ue-TxTEG-RequestUL-TDOA-Config* in *RRCReconfiguration* message is configured with *periodicReporting*:

2> for all the association changes store *ue-TxTEG-Association* corresponding to each *ue-TxTEG-ID* with *nr-TimeStamp*;

2> include the results in *ue-TxTEG-AssociationList* in the *UEPositioningAssistanceInfo* message on expiry of each configured period;

2> optionally include one *ue-TxTEG-TimingErrorMarginValue* for each *UEPositioningAssistanceInfo* message;

1> else if *ue-TxTEG-RequestUL-TDOA-Config* in *RRCReconfiguration* message is configured with *oneShot*:

2> identify the *ue-TxTEG-Association* corresponding to each *ue-TxTEG-ID* with *nr-TimeStamp*;

2> include the results in *ue-TxTEG-AssociationList* in the *UEPositioningAssistanceInfo* message only one time;

2> optionally include one *ue-TxTEG-TimingErrorMarginValue* for each *UEPositioningAssistanceInfo* message.

The UE shall submit the *UEPositioningAssistanceInfo* message to lower layers for transmission.

9.4.6.3 Test description

9.4.6.3.1 Pre-test conditions

System Simulator:

- Sub-test 29: NR Cell 1

UE:

-

Preamble:

- The UE is in state 3N-A as defined in TS 38.508-1 [30], subclause 4.4A on NR Cell 1.

Related PICS/PIXIT Statements:

-

9.4.6.3.2 Test procedure sequence

Table 9.4.6.3.2-1: Test Configuration

Test Configuration	Network Deployment Type	Test Implementation
B	NG-RAN NR	

Table 9.4.6.3.2-2: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	The SS sends a LPP message of type Request Capabilities.	<--	*DLInformationTransfer* (LPP REQUEST CAPABILITIES)	-	-
2	The UE sends a LPP message of type Provide Capabilities including the UE positioning capabilities.	-->	*ULInformationTransfer* (LPP PROVIDE CAPABILITIES)	-	-
3	IF the UE LPP message at step 2 includes an acknowledgment request THEN SS sends a LPP Acknowledgement response.	<--	*DLInformationTransfer* (LPP ACKNOWLEDGEMENT)	-	-
4	The SS sends an RRCReconfiguration message requesting the association information of UL SRS resources for positioning with Tx TEGs	<--	RRCReconfiguration		
5	Check: Does the UE send a UEPositioningAssistanceInfo message including TxTEG information?	-->	UEPositioningAssistanceInfo	1	P

9.4.6.3.3 Specific message contents

Table 9.4.6.3.3-1: DLInformationTransfer (step 1 and step 3, Table 9.4.6.3.2-2)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
DLInformationTransfer ::= SEQUENCE {			
rrc-TransactionIdentifier			
criticalExtensions CHOICE {			
dlInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.6.3.3-2	DL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.6.3.3-2: DL NAS TRANSPORT (DLInformationTransfer, Table 9.4.6.3.3-1)

Derivation Path: 24.501 Table 8.2.11.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000	Downlink generic NAS transport	
DL NAS TRANSPORT message identity	01101000	DL NAS transport	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 1:** Set according to Table 8.4-2	LPP Request Capabilities.	
	Step 3 Set according to Table 9.4.6.3.3-3	LPP Acknowledgement	
Additional information	Present	Routing Identifier/Correlation ID	

Table 9.4.6.3.3-3: LPP Acknowledgement (DL NAS TRANSPORT, Table 9.4.6.3.3-2)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID	Not present		
endTransaction	TRUE		
sequenceNumber	Not present		
acknowledgement SEQUENCE {			
ackRequested	FALSE		
ackIndicator	(0..255)	Contains the same value of the sequenceNumber field in step 1, Table 9.4.6.3.2-2	
}			
lpp-MessageBody	Not present.		
}			

Table 9.4.6.3.3-4: RRCReconfiguration (Step 4, Table 9.4.6.3.2-2)

Derivation Path: TS 38.508-1 [30], table 4.6.1-13			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier		
criticalExtensions CHOICE {			
rrcReconfiguration SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
nonCriticalExtension SEQUENCE {			
ue-TxTEG-RequestUL-TDOA-Config-r17 CHOICE SEQUENCE {			
setup SEQUENCE {			
UE-TxTEG-RequestUL-TDOA-Config-r17 CHOICE {			
oneShot-r17			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.4.6.3.3-5: ULInformationTransfer (step 2, Table 9.4.6.3.2-2)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
ULInformationTransfer ::= SEQUENCE {			
criticalExtensions CHOICE {			
ulInformationTransfer SEQUENCE {			
dedicatedNAS-Message OCTET STRING	Set according to Table 9.4.6.3.3-6	UL NAS TRANSPORT	
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			

Table 9.4.6.3.3-6: UL NAS TRANSPORT (ULInformationTransfer, Table 9.4.6.3.3-5)

Derivation Path: 24.501 Table 8.2.10.1.1			
Information Element	**Value/remark**	**Comment**	**Condition**
Extended Protocol discriminator	01111110	5GS mobility management messages	
Security header type	0000	Plain 5GS NAS message	
Spare half octet	0000		
UL NAS TRANSPORT message identity	01100111	UL NAS TRANSPORT	
Payload container type	0011	LTE Positioning Protocol (LPP) message container	
Spare half octet	0000		
Payload container	**Step 2:** Set according to Table 9.4.6.3.3-7	LPP Provide Capabilities	
Additional information	Present	The UE includes the Routing Identifier received in the Additional Information IE of the DOWNLINK GENERIC NAS TRANSPORT message (step 1 Table 9.4.6.3.3-2)	

Table 9.4.6.3.3-7: LPP Provide Capabilities (UL NAS TRANSPORT, Table 9.4.6.3.3-6)

Derivation Path: 37.355 clause 6.2			
Information Element	**Value/remark**	**Comment**	**Condition**
LPP-Message ::= SEQUENCE {			
transactionID SEQUENCE {			
initiator	locationServer		
transactionNumber	(0..255)	Contains the same value as the corresponding field in the LPP Request Capabilities message in step 1, Table 9.4.6.3.2-2	
}			
endTransaction	TRUE		
sequenceNumber	(0..255)		
acknowledgement SEQUENCE {	Present, or not present		
ackRequested	TRUE		
ackIndicator	Not present		
}			
lpp-MessageBody CHOICE {			
c1 CHOICE {			
provideCapabilities SEQUENCE {			
criticalExtensions CHOICE {			
c1 CHOICE {			
provideCapabilities-r9 SEQUENCE {			
nr-UL-ProvideCapabilities-r16	Dependent on UE capabilities		
}			
}			
}			
}			
}			
}			
}			
}			
}			
}			

Table 9.4.6.3.3-8: UEPositioningAssistanceInfo (step 5, Table 9.4.6.3.2-2)

Derivation Path: 38.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
UEPositioningAssistanceInfo-r17 ::= SEQUENCE {			
criticalExtensions CHOICE {			
uePositioningAssistanceInfo-r17 SEQUENCE {			
ue-TxTEG-AssociationList-r17 SEQUENCE (SIZE (1..maxNrOfTxTEGReport-r17)) OF UE-TxTEG-Association-r17 {	n entries	The size of UE-TxTEG-Association-r17 is depending on UE capabilities.	
UE-TxTEG-Association-r17[n] SEQUENCE {			
ue-TxTEG-ID-r17	Present. Depending on UE capabilities.		
nr-TimeStamp-r17 SEQUENCE {			
nr-SFN-r17	(0..1023)		
nr-Slot-r17	Present. Any value acceptable		
}			
associatedSRS-PosResourceIdList-r17	Present. Any value acceptable		
servCellId-r17	Not checked		
}			
}			
lateNonCriticalExtension { }	Not present		
nonCriticalExtension SEQUENCE {			
ue-TxTEG-TimingErrorMarginValue-r17	Not checked		
nonCriticalExtension	Not checked		
}			
}			
}			
}			

Annex A (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
36.571-2							
2010-08	R5#48	R5-104119			Initial skeleton proposal		0.0.0
	R5#48	R5-104741			Merge of documents R5-104119, R5-104120, R5-104121, R5-104122, together with small editorial modifications	0.0.0	0.0.1
2011-02	R5#50	R5-110250			Various corrections based on LPP v9.3.0 (R5-106431)	0.0.1	
					New test cases: LPP Reliable Transport (R5-106433)		
					New test cases: CS fallback (R5-106698)		0.1.0
2011-05	R5#51	R5-112388			Various corrections (R5-110251)	0.1.0	
					OTDOA default conditions (R5-110252)		0.2.0
2011-08	R5#52	R5-113770			Small corrections to 36.571-2 baseline text	0.2.0	
		R5-113771			Addition of LPP abort test case		
		R5-113147			Addition of Position Capability Transfer test case		
		R5-113140			Addition of Notification test cases		
		R5-113769			Addition of UE Network Capability test case		
		R5-113847			Addition of LPP Error handling test cases		1.0.0
37.571-2							
2011-11	R5#53	R5-115249			Creation of 37.571-2 based on 36.571-2 v1.0.0 and 34.123-1 v9.6.0		1.0.0
		R5-115250			Default conditions for ECID signalling test cases in 37.571-2 baseline text		
		R5-115251			Various corrections to the 37.571-2 baseline text		
		R5-115252			Default system information for UTRAN A-GNSS tests in 37.571-2 baseline text		2.0.0
2011-12	RAN#54	-	-	-	Moved to Rel-9 with editorial changes only.	2.0.0	9.0.0
2012-03	RAN#55	R5-120358	0001	-	Addition of missing test case 7.3.4.1	9.0.0	9.1.0
2012-03	RAN#55	R5-120359	0002	-	Addition of missing test case 7.3.4.2	9.0.0	9.1.0
2012-03	RAN#55	R5-120360	0003	-	Addition of missing test case 7.3.4.3	9.0.0	9.1.0
2012-03	RAN#55	R5-120361	0004	-	Addition of missing test case 7.3.4.4	9.0.0	9.1.0
2012-03	RAN#55	R5-120362	0005	-	Editorial corrections to 37.571-2	9.0.0	9.1.0
2012-03	RAN#55	R5-120363	0006	-	Completion of Test Case 7.3.1.1	9.0.0	9.1.0
2012-03	RAN#55	R5-120364	0007	-	Removal of FFS for Sub-test -7	9.0.0	9.1.0
2012-03	RAN#55	R5-120395	0008	-	Addition of RESET command to EPC MO-LR tests	9.0.0	9.1.0
2012-03	RAN#55	R5-120725	0009	-	Correction of MO-LR CS fallback test cases 7.4.1	9.0.0	9.1.0
2012-06	RAN#56	R5-121134	0010	-	Clarification to cell synchronization for OTDOA	9.1.0	9.2.0
2012-06	RAN#56	R5-121148	0011	-	Completion of Test Case 7.3.1.1	9.1.0	9.2.0
2012-06	RAN#56	-	-	-	Upgrade to v10.0.0 with no change.	9.2.0	10.0.0
2012-09	RAN#57	R5-123067	0012	-	Removal of FFS for Sub-test-7	10.0.0	10.1.0
2012-09	RAN#57	R5-123068	0013	-	Correction of references to clauses in 37.571-5	10.0.0	10.1.0
2012-09	RAN#57	R5-123070	0014	-	Editorial Corrections	10.0.0	10.1.0
2012-09	RAN#57	R5-123071	0015	-	Correction of MO-LR CS fallback test cases 7.4.1	10.0.0	10.1.0
2012-09	RAN#57	R5-123072	0016	-	Correction to UE Network Capability Test Procedure	10.0.0	10.1.0
2012-09	RAN#57	R5-123073	0017	-	Correction to Register and Facility message type content	10.0.0	10.1.0
2012-09	RAN#57	R5-123074	0018	-	Addition of RESET command to EPC MO-LR tests	10.0.0	10.1.0
2012-09	RAN#57	R5-123698	0019	-	Small corrections to default E-UTRAN message contents	10.0.0	10.1.0
2013-03	RAN#59	R5-130112	0021	-	Correction to LPP Request Location Information Message Content for TC 7.3.4.4	10.1.0	10.2.0
2013-03	RAN#59	R5-130593	0022	-	Correction of applicability for TC 7.3.2.3	10.1.0	10.2.0
2013-06	RAN#60	R5-131099	0023	-	Clarification of IE values	10.2.0	10.3.0
2013-06	RAN#60	R5-131100	0024	-	Correction of behaviour in 7.3.2.3	10.2.0	10.3.0
2013-06	RAN#60	R5-131101	0025	-	Simplification of test set-up for OTDOA and ECID tests	10.2.0	10.3.0
2013-06	RAN#60	R5-131306	0026	-	Correction to LTE UE Positioning test cases	10.2.0	10.3.0
2013-06	RAN#60	R5-131326	0027	-	Correction to available GNSS assistance data elements	10.2.0	10.3.0
2013-06	RAN#60	R5-131877	0028	-	Clarification of Sub-Test Case Numbers Tables	10.2.0	10.3.0
2013-06	RAN#60	R5-131878	0029	-	New test case for inter-frequency RSTD measurement indication procedure	10.2.0	10.3.0
2013-09	RAN#61	R5-133175	0030	-	Clarifications to 7.3.3.1	10.3.0	10.4.0
2013-12	RAN#62	R5-134907	0031	-	Addition of missing IEs from otdoa-ProvideCapabilities in 7.3.1.1	10.4.0	10.5.0
2013-12	RAN#62	R5-134908	0032	-	Change Applicability of test 7.3.5.1	10.4.0	10.5.0
2013-12	RAN#62	R5-134909	0033	-	Addition of Capability exchange in various clause 7 tests	10.4.0	10.5.0
2013-12	RAN#62	R5-134910	0034	-	Clarification of Provide Capabilities content for test 7.2.2.2	10.4.0	10.5.0
2014-03	RAN#63	R5-140133	0035	-	Add Assistance Data delivery to test 7.3.5.1	10.5.0	10.6.0
2014-03	RAN#63	R5-140606	0036	-	Correction to LTE UE Positioning test case 7.2.1.2	10.5.0	10.6.0
2014-03	RAN#63	R5-140608	0037	-	Correction to LTE UE Positioning test case 7.2.1.3	10.5.0	10.6.0
2014-03	RAN#63	R5-140793	0038	-	Correction to message content for inter-frequency RSTD measurement indication test case	10.5.0	10.6.0
2014-06	RAN#64	R5-142251	0039	-	Clarification of use of satellite simulator	10.6.0	10.7.0
2014-06	RAN#64	R5-142886	0040	-	Correction to EUTRA UE Positioning test cases 7.3.4.x	10.6.0	10.7.0
2014-09	RAN#65	R5-144194	0041	-	Clarification for configuration of cell 1 in OTDOA tests	10.7.0	10.8.0
2014-09	RAN#65	R5-144195	0042	-	RESET Positioning Information in LPP Abort Procedures	10.7.0	10.8.0
2014-09	RAN#65	R5-144237	0043	-	Adding extra neighbour cells to 7.3.5.1	10.7.0	10.8.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2014-09	RAN#65	R5-144626	0044	-	Correct OTDOA and ECID Elements in 7.3.4.2 and 7.3.4.4	10.7.0	10.8.0
2014-09	RAN#65	R5-144702	0045	-	Correction to test case 7.5.1, Table 7.5.1.3.2-1: Main behaviour	10.7.0	10.8.0
2014-09	RAN#65	R5-144703	0046	-	Updates OTDOA Neighbour Cell Info List	10.7.0	10.8.0
2014-12	RAN#66	R5-145137	0047	-	Clarification to OTDOA Assistance Data	10.8.0	10.9.0
2014-12	RAN#66	R5-145347	0048	-	Addition of Galileo in test 7.3.3	10.8.0	10.9.0
2014-12	RAN#66	R5-145736	0049	-	Correction to OTDOA related default message contents in LPP common procedure for Position Capability Transfer	10.8.0	10.9.0
2014-12	RAN#66	-	-	-	Raised to v 11.0.0 with no change	10.9.0	11.0.0
2014-12	RAN#66	R5-145737	0050	-	Addition of Beidou	11.0.0	12.0.0
2015-03	RAN#67	R5-150741	0051	-	Abbreviation Corrections for BDS in 37.571-2	12.0.0	12.1.0
2015-06	RAN#68	R5-151109	0054	-	IMS settings for LTE Positioning test cases	12.1.0	12.2.0
2015-06	RAN#68	R5-151981	0053	1	Correction of prs-ConfigurationIndex for TDD	12.1.0	12.2.0
2015-06	RAN#68	R5-151982	0055	1	LPP updates and corrections	12.1.0	12.2.0
2015-06	RAN#68	R5-151983	0056	1	Update of default GNSS Assistance Data Elements	12.1.0	12.2.0
2015-06	RAN#68	R5-151984	0057	1	Correction to EUTRA UE Positioning test case 7.3.3.1	12.1.0	12.2.0
2015-06	RAN#68	R5-152147	0058	1	Correction to EUTRA UE Positioning test cases covering the UE-assisted case	12.1.0	12.2.0
2015-06	RAN#68	R5-152149	0052	2	Addition of "early fix" to A-GNSS tests	12.1.0	12.2.0
2015-09	RAN#69	R5-153110	0059	-	Correction to GANSS Multi-frequency Measurement Requested IE	12.2.0	12.3.0
2015-09	RAN#69	R5-153111	0060	-	Corrections to MEASUREMENT CONTROL messages	12.2.0	12.3.0
2015-09	RAN#69	R5-153153	0061	-	Missing " earlyFixReport-r12 " in Table 7.2.2.2.3.3-13	12.2.0	12.3.0
2015-09	RAN#69	-	-	-	update of the "non-specific references" in section 2 according to the approved R5-153582 and an action point on ETSI MCC	12.2.0	12.3.0
2015-12	RAN#70	R5-155101	0064	-	Correction to use of Modernized GPS with BDS	12.3.0	12.4.0
2016-03	RAN#71	R5-160354	0067	-	Addition of extra call flow to test case 7.3.4.4	12.4.0	12.5.0
2016-09	RAN#73	R5-165993	0069	1	Add missing references to GPS and Galileo and A-GPS and A-Galileo	12.5.0	12.6.0
2016-09	RAN#73	R5-165996	0070	1	Addition of Indoor Positioning Protocol Conformance Testing (MBS)	12.6.0	13.0.0
2016-12	RAN#74	R5-168065	0071	-	Change of applicability of ECID tests for TDD	13.0.0	13.1.0
2016-12	RAN#74	R5-168461	0073	-	Missing Satellite signal sub-test case reference	13.0.0	13.1.0
2016-12	RAN#74	R5-168463	0075	-	Incorrect Procedure Step referenced for Main behaviour Table	13.0.0	13.1.0
2016-12	RAN#74	R5-169094	0074	1	Correction in Table 7.3.4.4.3.3-11 for sub test 6	13.0.0	13.1.0
2016-12	RAN#74	R5-169100	0072	1	Addition of TC 7.3.3.1A	13.0.0	13.1.0
2016-12	RAN#74	R5-169101	0076	1	Add WLAN signalling sub-test and references for Indoor Positioning	13.0.0	13.1.0
2016-12	RAN#74	R5-169102	0077	1	Add BT signalling sub-test and references for Indoor Positioning	13.0.0	13.1.0
2016-12	RAN#74	R5-169103	0078	1	Add Sensor signalling sub-test and references for Indoor Positioning	13.0.0	13.1.0
2017-03	RAN#75	R5-170736	0079	-	Remove Bluetooth Abbreviations and Add Missing References for WLAN	13.1.0	13.2.0
2017-03	RAN#75	-	-	-	Administrative release upgrade to match the release of 3GPP TS 37.571-1 which was upgraded at RAN#74 to Rel-14 due to Rel-14 relevant CR(s)	13.2.0	14.0.0
2017-06	RAN#76	R5-172963	0082	1	Merge GNSS sub-tests into one sub-test	14.0.0	14.1.0
2017-06	RAN#76	R5-172964	0084	1	Correction to tbs-ProvideCapabilities in several tables	14.0.0	14.1.0
2017-06	RAN#76	R5-172967	0083	1	Introduction of MBS Assistance Data Signalling Sub-test 16	14.0.0	14.1.0
2017-09	RAN#77	R5-173685	0086	-	Editorial changes for Release 14 alignment with core specification	14.1.0	14.2.0
2017-09	RAN#77	R5-173922	0089	-	Clarifications to test 7.2.2.1 for UEs that support more than one positioning technology	14.1.0	14.2.0
2017-09	RAN#77	R5-174060	0091	-	Editorial change to remove referenced text for ‘signals switched off or not present’ in Section 7	14.1.0	14.2.0
2017-09	RAN#77	R5-174582	0087	1	Correction to Inter-frequency RSTD measurement indication test cases 7.5.1 to support Band > 64	14.1.0	14.2.0
2017-09	RAN#77	R5-174583	0090	1	Editorial change to correct typos and missing Information Elements in tables	14.1.0	14.2.0
2017-09	RAN#77	R5-174585	0088	1	Editorial change to correct IEs	14.1.0	14.2.0
2017-12	RAN#78	R5-176088	0092	-	Correction to LPP ProvideAssistanceData for UE Based MBS	14.2.0	14.3.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2017-12	RAN#78	R5-176569	0093	-	Addition of Rel-14 WLAN Positioning Protocol Tests and Sub-Tests	14.2.0	14.3.0
2017-12	RAN#78	R5-176570	0094	-	Addition of Rel-14 Sensor Positioning Protocol Tests and Sub-Tests	14.2.0	14.3.0
2017-12	RAN#78	R5-176574	0095	-	Correction for UE Assisted TBS Request Location Information Table	14.2.0	14.3.0
2017-12	RAN#78	R5-176576	0096	-	Deletion of Duplicated IEs in Table 5.4.1.3-2	14.2.0	14.3.0
2017-12	RAN#78	R5-177039	0097	1	Editorial change to correct typos, grammar, descriptive text in table content, missing references and formatting issues	14.2.0	14.3.0
2017-12	RAN#78	-	-	-	Administrative release upgrade to match the release of 3GPP TS 37.571-1 which was upgraded at RAN#78 to Rel-15 due to Rel-15 relevant CR(s)	14.3.0	15.0.0
2018-03	RAN#79	R5-181111	0102	-	Update Main Behaviour positioning method	15.0.0	15.1.0
2018-03	RAN#79	R5-181112	0103	-	Missing Release 14 Information Element for otdoa	15.0.0	15.1.0
2018-03	RAN#79	R5-181113	0104	-	Update Simulated Environment conditions for MBS, WLAN, and Bluetooth	15.0.0	15.1.0
2018-06	RAN#80	R5-182957	0106	-	Correction to UE Positioning TCs 7.2.2.1 + 7.2.2.2	15.1.0	15.2.0
2018-06	RAN#80	R5-183169	0105	1	Addition of Rel-14 LPP message segmentation IEs into Capabilities messages	15.1.0	15.2.0
2018-09	RAN#81	R5-184037	0108	-	Addition of PICS for support of LPP message segmentation in test 7.3.1.1	15.2.0	15.3.0
2018-12	RAN#82	R5-186618	0109	-	Addition of NR background information	15.3.0	15.4.0
2018-12	RAN#82	R5-186695	0110	-	Addition of Rel-12 missing IEs to LPP message contents	15.3.0	15.4.0
2018-12	RAN#82	R5-186696	0111	-	Addition of Rel-15 missing IEs to LPP message contents	15.3.0	15.4.0
2018-12	RAN#82	R5-187726	0112	1	Positioning NSA Protocol tests - LPP Procedures	15.3.0	15.4.0
2019-03	RAN#83	R5-192382	0113	1	Addition NR SA positioning tests and removal of NSA	15.4.0	15.5.0
2019-03	RAN#83	-	-	-	Administrative release upgrade to match the release of TS 37.571-1 which was upgraded at RAN#83 to Rel-16 due to a Rel-16 relevant CR	15.5.0	16.0.0
2019-06	RAN#84	R5-195201	0119	-	Addition of information for test environments for NR	16.0.0	16.1.0
2019-06	RAN#84	R5-195203	0118	1	Clean Up of NR Positioning Test Cases	16.0.0	16.1.0
2019-09	RAN#85	R5-197164	0124	1	Correction to Testcases 7.2.2.2, 7.3.4.2 and 7.3.4.4	16.1.0	16.2.0
2019-09	RAN#85	R5-197166	0120	1	Addition of sub-test information for NR tests	16.1.0	16.2.0
2019-09	RAN#85	R5-197167	0121	1	Alignment of NR terminology	16.1.0	16.2.0
2019-09	RAN#85	R5-197168	0122	1	Complete positioning protocol tests for NR	16.1.0	16.2.0
2019-09	RAN#85	R5-197169	0123	1	Add default conditions for FR2 positioning tests	16.1.0	16.2.0
2019-09	RAN#85	R5-197170	0125	1	Clean Up of NR Positioning Test Cases	16.1.0	16.2.0
2019-09	RAN#85	R5-197175	0126	-	Missing Values from Request Assistance Data Table	16.1.0	16.2.0
2019-12	RAN#86	R5-198966	0127	1	Additional test coverage for multi-frequency GNSS test cases	16.2.0	16.3.0
2019-12	RAN#86	R5-198967	0128	1	Update to protocol positioning tests	16.2.0	16.3.0
2020-03	RAN#87	R5-201010	0131	1	ECID test cases deleted for NR Test Configuration B up to and including LPP Rel-15	16.3.0	16.4.0
2020-03	RAN#87	R5-201012	0129	1	Editorial changes to TS 37.571-X titles to remove references to individual RATs	16.3.0	16.4.0
2020-06	RAN#88	R5-203511	0133	-	Correction of WLAN Assistance Data Element referenced clause	16.4.0	16.5.0
2020-06	RAN#88	R5-204489	0132	1	Adding measurement gaps for OTDOA configuration	16.4.0	16.5.0
2020-06	RAN#88	R5-204532	0134	1	Addition of OTDOA information for pre-test conditions for test 9.3.3.1B	16.4.0	16.5.0
2020-12	RAN#90	R5-205211	0136	-	Addition of miscellaneous Release 16 fields to tables in test case 7.3.1.1	16.5.0	16.6.0
2020-12	RAN#90	R5-205667	0139	-	Clarification of configuration of measurement gaps for OTDOA in NR tests	16.5.0	16.6.0
2020-12	RAN#90	R5-206424	0137	1	Addition of BDS B1C Signal test contents in TS 37.571-2	16.5.0	16.6.0
2020-12	RAN#90	R5-206442	0135	1	Deletion of tests 7.3.3.1, 7.3.3.1A, 9.3.3.1 and 9.3.3.1A	16.5.0	16.6.0
2020-12	RAN#90	R5-206443	0138	1	Corrections to LPP Provide Assistance Data for NR test cases in clause 9	16.5.0	16.6.0
2021-03	RAN#91	R5-210258	0140	-	Definition of values for epdu fields	16.6.0	16.7.0
2021-03	RAN#91	R5-210260	0141	-	Corrections and clarifications to default MBS, WLAN and Sensor assistance data in clause 5.4.1	16.6.0	16.7.0
2021-03	RAN#91	R5-211298	0142	-	Corrections for support of multiple GPS signals	16.6.0	16.7.0
2021-06	RAN#92	R5-213638	0144	1	Addition of NR Rel 16 positioning methods information into protocol conformance test cases for NR	16.7.0	16.8.0
2021-06	RAN#92	R5-213639	0145	1	Addition of NR Rel 16 positioning methods into default conditions for NR	16.7.0	16.8.0
2021-09	RAN#93	R5-215154	0149	-	Clarifications for OTDOA (LTE) test cases for NR	16.8.0	16.9.0
2021-09	RAN#93	R5-215616	0151	-	Clarification text on LCS Sub-Test Cases	16.8.0	16.9.0
2021-09	RAN#93	R5-216322	0147	1	Correction to NR positioning method information in Position Capability Transfer test case	16.8.0	16.9.0
2021-09	RAN#93	R5-216323	0148	1	Addition of assistance data information elements for Multi-RTT, DL-AoD and DL-TDOA positioning methods	16.8.0	16.9.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2021-12	RAN#94	R5-217127	0155	-	Correction to pre-test conditions for NR DL-TDOA UE-Based test cases	16.9.0	16.10.0
2021-12	RAN#94	R5-217936	0152	1	Addition of RESET UE POSITIONING STORED INFORMATION message contents	16.9.0	16.10.0
2021-12	RAN#94	R5-217937	0153	1	Correction of the test steps for Multi-RTT sub-tests	16.9.0	16.10.0
2021-12	RAN#94	R5-217938	0154	1	Correction of the conditions for Multi-RTT and DI-AoD assistance data elements	16.9.0	16.10.0
2022-03	RAN#95	R5-221592	0156	1	Addition of TC 9.4.1 PosSIB broadcasting followed by location information transfer	16.10.0	16.11.0
2022-03	RAN#95	R5-221593	0157	1	Correction of the assistance data elements for NR positioning support	16.10.0	16.11.0
2022-06	RAN#96	R5-223388	0158	1	Correction of TC 9.4.1 PosSIB broadcasting followed by location information transfer	16.11.0	16.12.0
2022-06	RAN#96	R5-223389	0159	1	Addition of TC 9.4.2 PosSIB broadcasting followed by location information transfer / Positioning SI messages offset	16.11.0	16.12.0
2022-06	RAN#96	R5-223390	0160	1	Addition of TC 7.5.2 PosSIB broadcasting followed by location information transfer	16.11.0	16.12.0
2022-09	RAN#97	R5-224406	0162	-	Removal of test case 7.5.2	16.12.0	16.13.0
2022-09	RAN#97	R5-224407	0163	-	Correction of posSIB broadcasting test case	16.12.0	16.13.0
2022-09	RAN#97	R5-225313	0161	1	Correction to LPP Provide Capabilities template for subclause 9 test cases	16.12.0	16.13.0
2022-09	RAN#97	R5-225314	0164	1	Addition of on-demand PosSIB followed by location information transfer in RRC_connected state	16.12.0	16.13.0
2022-12	RAN#98	R5-226459	0165		Correction of on-demand posSIB test case in RRC_connected	16.13.0	16.14.0
2022-12	RAN#98	R5-226513	0166		Correction to MeasGapConfig	16.13.0	16.14.0
2022-12	RAN#98	R5-226515	0168		Correction to NR-DL-PRS-Info	16.13.0	16.14.0
2022-12	RAN#98	R5-227526	0167	1	Correction to NR DL-PRS Assistance Data	16.13.0	16.14.0
2022-12	RAN#98	R5-227527	0169	1	Include measObject as part of the measConfig message	16.13.0	16.14.0
2023-03	RAN#99	R5-231022	0171	-	Correction to NR-DL-PRS-Info parameters	16.14.0	16.15.0
2023-03	RAN#99	R5-230335	0170	-	Introduction of BDS B2a and B3I signal test contents in TS 37.571-2	16.15.0	17.0.0
2023-06	RAN#100	R5-233395	0173	1	Introduction of R17 Positioning Enhancements default test conditions in TS 37.571-2	17.0.0	17.1.0
2023-06	RAN#100	R5-233396	0174	1	Addition of new positioning test case for pre-configured measurement gap procedures	17.0.0	17.1.0
2023-06	RAN#100	R5-233397	0175	1	Addition of new positioning test case for pre-configured PRS processing window procedures	17.0.0	17.1.0
2023-06	RAN#100	R5-233398	0176	1	Addition of new positioning test case for UE positioning assistance information procedures	17.0.0	17.1.0
2023-09	RAN#101	R5-234217	0179	-	Correction of test case 9.4.6 UE Positioning Assistance Information	17.1.0	17.2.0
2023-09	RAN#101	R5-234218	0180	-	Correction of test case 9.4.5 Pre-configured PRS processing window procedures	17.1.0	17.2.0
2023-09	RAN#101	R5-234219	0181	-	Correction of test case 9.4.4 Pre-configured Measurement Gap Procedures	17.1.0	17.2.0
2023-09	RAN#101	R5-235341	0178	1	Addition of Rel-17 missing IEs to LPP position capability transfer test case	17.1.0	17.2.0
2024-03	RAN#103	R5-240513	0182	-	Correction to NR Physical Cell IDs for NR-PRS assistance data	17.2.0	17.3.0
2024-06	RAN#104	R5-243569	0183	1	Correction to LPP positioning test case 9.3.4.2	17.3.0	17.4.0
2024-12	RAN#106	R5-246428	0184	-	Addition of default test condition for Rel-18 positioning work item	17.4.0	18.0.0
2024-12	RAN#106	R5-246429	0185	-	Addition of new LPP carrier phase positioning test case	17.4.0	18.0.0
2024-12	RAN#106	R5-246430	0186	-	Addition of new LPP frequency hopping test case for redcap UE	17.4.0	18.0.0

History

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