3GPP TSG CT WG3 Meeting #126 C3-230402

Athens, Greece, 27th Feb - 03rd March, 2023 (revision of CP-223267)

**Source: CATT**

**Title: Revised WID on CT aspects of enhancement to the 5GC location services - phase 3**

**Document for: Approval**

**Agenda Item: 18.1.2**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>   
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

Title: CT aspects of enhancement to the 5GC location services - phase 3

Acronym: 5G\_eLCS\_Ph3

Unique identifier: 980003

Potential target Release: Rel-18

# 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Affects: | UICC apps | ME | AN | CN | Others (specify) |
| Yes |  | X |  | X |  |
| No | X |  | X |  |  |
| Don't know |  |  |  |  | X |

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

### This work item is a …

|  |  |
| --- | --- |
|  | Study |
|  | Normative – Stage 1 |
|  | Normative – Stage 2 |
| X | Normative – Stage 3 |
|  | Normative – Other\* |

**\* Other = e.g. testing**

## 2.2 Parent Work Item

For a brand-new topic, use “N/A” in the table below. Otherwise indicate the parent Work Item.

|  |  |  |  |
| --- | --- | --- | --- |
| Parent Work / Study Items | | | |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| 5G\_eLCS\_Ph3 | SA2 | 970021 | Enhancement to the 5GC LoCation Services - Phase 3 |

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work /Study Items (if any) | | |
| Unique ID | Title | Nature of relationship |
| 910006 | CT aspects of 5G\_eLCS\_ph2 | Normative work for 5GC LoCation Services in Rel-17 |
| 830003 | CT aspects of 5G\_eLCS | Normative work for 5GC LoCation Services in Rel-16 |

# 3 Justification

SA2 has studied the Enhancement to the 5GC LoCation Services – Phase 3 under the study item FS\_eLCS\_Ph3. The study work has been concluded. The conclusions are captured in 3GPP TR 23.700-71 and provide a good overview of what is to be continued into normative phase and impacts to other working groups. Furthermore, work item "Enhancement to the 5GC LoCation Services - Phase 3" (5G\_eLCS\_Ph3) for SA2 normative work was approved in TSG SA Meeting SP#97e, and revised version approved in SA2 meeting #153E.

Therefore, impacts on protocols and interfaces under CT WGs’ responsibilities are foreseen and the related work in CT WGs should be carried out within Rel-18.

# 4 Objective

The objective of this work item is to develop the specifications under remit of CT WGs for the stage 2 requirements agreed under the stage 2 work item 5G\_eLCS\_Ph3. Work will start only when normative stage 2 requirements are available.

The following areas of work are expected to be covered (non-exhaustive, additional areas can be identified based on progress in normative work in SA2):

**CT4:**

- For support of user plane positioning:

- Impact to the LMF to decide to use user plane positioning and send its UP positioning address and security related information to UE;

- Potential impact to the GMLC/AMF/LMF to deliver AF/LCS client address to UE;

- Impact to the Supplementary services to support user plane positioning procedures.

- For support of enhanced positioning architecture for NPN deployment:

- Potential impact to the GMLC/LMF to transfer UE location from LMF to GMLC directly for all types of location request.

- For support of local area restriction for an LMF and GMLC:

- Impact to the AMF to support LMF ID for LMF selection;

- Potential impact to the UDM/UDR to support LMF ID storing and fetching.

- For support of interaction between Location Service and NWDAF:

- Potential impact to the LMF to support indoor/outdoor indication and send it to NWDAF;

- Potential impact to the GMLC to provide location information to NWDAF.

- For support of assistance data provisioning for low power high accuracy GNSS positioning:

- Impact to the NRF to support GNSS assistance data for NEF, LMF and trusted AF information.

- For support of unawareness positioning:

- Impact to the GMLC/AMF/LMF services to support indication of unawareness positioning and possible new reject cause.

- For support of Positioning Reference Units:

- Impact to the LMF to support handling PRU related information;

- Potential impact to the NRF services to support management and discovery of LMF profile with PRU function;

- Potential impact to the AMF to support PRU related procedure.

- For support of location service continuity in case of UE mobility:

- Impact to the AMF to support new reject cause and MME ID to cancel LCS session for 5GS to EPS mobility;

- Impact to the SLg interface to support new reject cause and MME ID to cancel LCS session for EPS to 5GS mobility;

- Potential impact to the AMF/LMF to support notification of location information including the QoS for EPS to GMLC;

- Potential impact to the AMF/LMF to report handover complete event to GMLC;

- Potential impact to the SLg interface to report handover complete event to GMLC;

- Potential impact to the AMF to transfer LCS session date between S-AMF and T-AMF.

- For support of Positioning Requirements Related to Satellite Access:

- Potential impact to the LMF to support verification of UE location.

- For support of Reduced Latency:

- Potential impact to the GMLC/LMF to use user plane positioning to reduce latency.

- To enhance the triggered location reporting for UE power saving purpose:

- Potential impact to the AMF/UDM/UDR/GMLC/LMF to support event report allowed area;

- Impact to the lcs-LocationPrivacySetting and lcs-PeriodicTriggeredInvoke operations of Supplementary services.

- For support of low power and/or high accuracy positioning:

- Impact to the AMF/UDM/UDR/GMLC/LMF to support LPHAP indication.

**CT1:**

- For support of user plane positioning:

- Impact to the control plane LCS procedure to transfer UP positioning address and security related information to UE;

- User plane connection protocol decision and design;

- Impact to NAS protocol to support e.g. indicating UE capability of supporting user plane positioning;

- For support of Positioning Reference Units:

- Impact to the control plane LCS procedure to support PRU Registration.

- For support of location service continuity in case of UE mobility between 5GS and EPS:

- Potential impact to the control plane LCS procedure to support triggered location event reporting applicable to the target system (e.g. with the location QoS applicable to EPS in case of mobility from 5GS to EPS).

- To enhance the triggered location reporting for UE power saving purpose:

- Impact to the control plane LCS procedure to support event report allowed area.

**CT3:**

- For support of user plane positioning:

- Impacts to the Nnef\_EventExposure service API (northbound interface) to deliver AF user plane addressing and security information to the UE.

- For support assistance data provisioning for low power high accuracy GNSS positioning:

- Impacts to the Nnef\_EventExposure API (southbound interface) to expose GNSS assistance data.

- Impacts to the Naf\_EventExposure service API to expose GNSS assistance data.

- To enhance the triggered location reporting for UE power saving purpose:

- Potential impacts to the Nnef\_EventExposure service API (northbound interface) to support the provisioning of event report allowed area.

# 5 Expected Output and Time scale

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| New specifications {One line per specification. Create/delete lines as needed} | | | | | |
| Type | TS/TR number | Title | For info  at TSG# | For approval at TSG# | Rapporteur |
| TS | 24.572 | 5G System; User plane Location Services (LCS) protocols and procedures; Stage 3 | CT#100  (Jun. 2023) | CT#103  (Mar, 2024) | CT1 responsibility  Zhao, Xiaoxue,  CATT, [zhaoxiaoxue@cictmobile.com](mailto:zhaoxiaoxue@cictmobile.com) |

|  |  |  |  |
| --- | --- | --- | --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| 29.518 | 1. Possible impacts to support user plane positioning, e.g. to transfer AF/LCS client address to UE.  2. Updates to support LMF ID for LMF selection.  3. Updates to support unawareness positioning.  4. Possible impacts on AMF to support PRU  5. Updates to support location service continuity, e.g. to define new cause and transfer MME ID to GMLC, notify location information including the QoS for EPS to GMLC, report handover complete event, transfer LCS session date, etc.  6. Updates to support event report allowed area to enhance the triggered location reporting for UE power saving purpose. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.515 | 1. Possible impacts to support user plane positioning, e.g. to transfer AF/LCS client address to UE.  2. Possible impacts to support enhanced positioning architecture for NPN deployment, e.g. to receive UE location from LMF directly.  3. Possible impacts to support interaction with NWDAF, e.g. to add indoor/outdoor indication and act as a new consumer of NWDAF.  4. Updates to support unawareness positioning.  5. Updates to support location service continuity, e.g. to receive handover complete event.  6. Possible impacts to support reduced latency.  7. Updates to support event report allowed area to enhance the triggered location reporting for UE power saving purpose.  8. Updates to support LPHAP. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.572 | 1. Possible impacts to support user plane positioning, e.g. to transfer AF/LCS client address to UE.  2. Possible impacts to support enhanced positioning architecture for NPN deployment, e.g. to notify UE location to GMLC directly.  3. Possible impacts to support interaction with NWDAF, e.g. to add indoor/outdoor indication.  4. Updates to support unawareness positioning.  5. Updates to support PRU related information.  6. Updates to support location service continuity, e.g. to notify the QoS for EPS to GMLC.  7. Possible impacts to support verification of UE location for satellite access.  8. Possible impacts to support reduced latency.  9. Updates to support event report allowed area to enhance the triggered location reporting for UE power saving purpose.  10. Updates to support LPHAP. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.510 | 1. Updates to support GNSS assistance data for NEF, LMF and Trusted AF information.  2. Possible updates to support LMF profile with PRU function and LMF discovery. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.503 | 1. Possible impact on UDM service to support LMF ID.  2. Updates to support event report allowed area to enhance the triggered location reporting for UE power saving purpose.  3. Updates to support LPHAP. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.504 | 1. Possible impact to support LMF ID.  2. Possible impact to support event report allowed area to enhance the Triggered Location for UE power saving purpose.  3. Possible impact to support LPHAP indication. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.505 | 1. Possible impact to support LMF ID.  2. Possible impact to support event report allowed area to enhance the triggered location reporting for UE power saving purpose.  3. Possible impact to support LPHAP indication. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.172 | 1. Updates to SLg interface to support location service continuity, e.g. to add new reject cause and AMF ID to cancel LCS session, notify GMLC the handover complete state. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.571 | Potential impacts to define new common data types. | CT#103  (Mar, 2024) | CT4 responsibility |
| 24.080 | 1. Impacts to support user plane positioning.  2. Update lcs-LocationPrivacySetting and lcs-PeriodicTriggeredInvoke operations to support power saving area and event report allowed area. | CT#103  (Mar, 2024) | CT4 responsibility |
| 29.122 | 1. Impacts to support user plane positioning, e.g. to transfer AF/LCS client address to the UE.  2. Potential impacts to support the provisioning of event report allowed area information. | CT#103  (Mar, 2024) | CT3 responsibility |
| 29.522 | 1. Impacts to support user plane positioning, e.g. to transfer AF/LCS client address to the UE.  2. Potential impacts to support the provisioning of event report allowed area information. | CT#103  (Mar, 2024) | CT3 responsibility |
| 29.591 | 1. Impacts to support assistance data provisioning for low power high accuracy GNSS positioning, e.g. to expose GNSS assistance data. | CT#103  (Mar, 2024) | CT3 responsibility |
| 29.517 | 1. Impacts to support assistance data provisioning for low power high accuracy GNSS positioning, e.g. to expose GNSS assistance data | CT#103  (Mar, 2024) | CT3 responsibility |
| 24.571 | 1. Updates to control plane LCS procedure to transfer UP positioning address and security related information to UE.  2. Updates to support PRU Registration.  3. Possible update to support location service continuity between 5GS and EPS, e.g. to notify the UE of the location QoS applicable to EPS in case of mobility from 5GS to EPS.  4. Update to support event report allowed area to enhance the triggered location reporting for UE power saving purpose. | CT#103  (Mar, 2024) | CT1 responsibility |
| 24.501 | Impact to NAS protocol to support e.g. indicating UE capability of supporting user plane positioning. | CT#103  (Mar, 2024) | CT1 responsibility |

# 6 Work item Rapporteur(s)

Wang, Baixiao, CATT, [wangbaixiao@cictmobile.com](mailto:wangbaixiao@cictmobile.com)

# 7 Work item leadership

CT4

# 8 Aspects that involve other WGs

SA3 (security)

# 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| CATT |
| China Mobile |
| China Telecom |
| Ericsson |
| Huawei |
| Samsung |
| ZTE |
| Nokia |
| Nokia Shanghai Bell |
| vivo |
| Intel |
| Qualcomm Incorporated |