**3GPP TSG-CT WG3 Meeting #130 *C3-234313***

**Xiamen, China, 09– 13 October 2023** **(revision of CP-230331)**

**Source: Xiaomi**

**Title: Revised WID on CT aspects of Ranging\_SL**

**Document for: Approval**

**Agenda Item: 18.1.1 (CT1) / 18.1.2 (CT3) / 5 (CT4)**

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 Ranging based services and sidelink positioning

Acronym: Ranging\_SL

Unique identifier: TBD

Potential target Release: Rel-18

# 1 Impacts

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

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

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

## 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) |
| Ranging\_SL | SA2 | 980015 | Architecture Enhancement to support Ranging based services and Sidelink Positioning |

## 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 880039 | Study on Ranging-based Services | Rel-18 SA1 study item, which provides Stage 1 potential 5G service requirements for ranging based services. |
| 910034 | Stage 1 for Ranging | Rel-18 SA1 work item, which provides normative service requirement for ranging. |
| 880075 | Study on scenarios and requirements of in-coverage, partial coverage, and out-of-coverage NR positioning use cases | Rel-18 RAN study item, which provides scenarios and requirements of in-coverage, partial coverage, and out-of-coverage NR positioning use cases |
| 940069 | Study on Ranging based services and sidelink positioning | Rel-18 SA2 study item, which specifies architecture enhancement for supporting ranging based services and sidelink positioning. |
| 960036 | Study on Security Aspects of Ranging Based Services and Sidelink Positioning | Rel-18 SA3 study item, which specifies security and privacy aspects of ranging based services and sidelink positioning. |
| 940081 | Study on expanded and improved NR positioning | Rel-18 RAN study item, which provides Ranging and Sidelink Positioning RAN solutions |
| 981038 | Expanded and improved NR positioning | Rel-18 RAN work item, which specifies Ranging and Sidelink Positioning RAN solutions |

# 3 Justification

SA2 has studied the Architectural Enhancements to support Ranging based services and sidelink positioning under the study item FS\_Ranging\_SL. The study work has been completed, and the conclusions are captured in clause 8 of 3GPP TR 23.700-86 which provides a guidance for the normative work as well as the dependency on other working groups. Furthermore, the corresponding SA2 work item "Architectural Enhancements to support Ranging based services and Sidelink Positioning" (Ranging\_SL) was approved in TSG SA#98-e. The normative work will have impact on stage 3 specifications. Therefore, it is necessary for a new CT work item to implement the stage-2 requirements for Ranging based services and sidelink positioning in 5GS.

# 4 Objective

The objective of this work is to specify the CT aspects of Ranging based services and sidelink positioning in 5GS in order to enhance the CT WGs specifications based on the stage-2 requirements. Normative work to be developed by SA WGs and RAN WGs which impact CT WGs will be considered as soon as those are available.

The expected work per the TSG CT group includes:

**CT1:**

* support for service authorisation and (pre-) configuration/provisioning to the UE, including:
	1. When the UE is served by NG-RAN, indicate in which PLMNs the UE is authorized to perform Ranging based services and sidelink positioning over PC5 reference point for acquiring relative distance, relative direction, high accuracy relative distance and high accuracy relative direction.
	2. When the UE is not served by NG-RAN, indicates whether the UE is authorized to perform Ranging based services and sidelink positioning over PC5 reference point for acquiring relative distance, relative direction, high accuracy relative distance and high accuracy relative direction.
	3. Possible updates to support QoS handling for Ranging based services and sidelink positioning, e.g. the mapping between the related services identifier (e.g. ProSe identifiers, V2X service types) and the corresponding QoS parameters.
	4. Updates to support specific parameters to indicate the expected roles of the UEs (e.g. Target UE, SL Reference UE).
* support for Discovery of SL Reference UE, Target UE and SL Positioning Server UE for performing Ranging based service and Sidelink Positioning, including:
	1. updates to 5G ProSe Model A and Model B Direct Discovery over PC5 reference point,
	2. updates to procedures for V2X communication over PC5 reference point;
* support for Ranging/Sidelink Positioning control procedures for both Network-assisted Operation and UE-only Operation in different network coverage cases (i.e., In Network Coverage, Partial Network Coverage and Out of Network Coverage cases) to perform Ranging/Sidelink Positioning, including:
	1. updates to support Ranging/Sidelink Positioning control procedures between one and multiple UEs or between two UEs over PC5 interface;
	2. updates to support Network assisted Sidelink Positioning for In Network Coverage and Partial Network Coverage of UE with/without NAS connection;
* support for Ranging/Sidelink Positioning service exposure including triggering Ranging and Sidelink Positioning between two UEs and exposure of the result to the initiating party, including:
	1. the exposure to SL Client UE through PC5 interfaces, and though 5GC network;
	2. the exposure to AF by enhancing the related eLCS procedures;
	3. the exposure to 5GC NF by enhancing the related eLCS procedures;

**CT3:**

* updates to the NEF northbound interface (i.e. Nnef\_EventExposure reusing the eLCS feature) to support the exposure of Ranging based services and sidelink positioning to an AF;
* updates to the NEF northbound interface (i.e. Nnef\_ServiceParameter API) to support the provisioning of Ranging/SideLink Positioning service parameters by an AF;
* updates to the NEF interface to support the mapping between application layer ID and GPSI consumed by an GMLC;
* updates to the UDR to support the provisioning and storage of Ranging/SideLink Positioning service parameters;
* updates to the PCF to support service authorisation policy and parameters provisioning in Ranging based services and sidelink positioning;

**CT4:**

* potential updates to UDM and UDR for subscription to support Ranging based services and sidelink positioning, e.g., storage of subscription data related to Ranging based services and sidelink positioning;
* potential updates to NRF to support Ranging based services and sidelink positioning;
* potential updates to LMF to support Ranging based services and sidelink positioning, e.g., support Network -assisted Operation and Network assisted Ranging/Sidelink Positioning;
* potential updates to GMLC to support Ranging based services and sidelink positioning, e.g., expose Ranging/Sidelink Positioning service to SL Client UE, 5GC NF or AF over 5GC;
* potential updates to AMF to support Ranging based services and sidelink positioning, e.g., UE Positioning assisted by Sidelink Positioning and involving 5GC;
* support the SideLink Positioning Key Management Function (SLPKMF) services for the security and privacy aspects of Ranging based services and sidelink positioning.
* potential updates to Supplementary services specification to support Ranging based services and sidelink positioning.

# 5 Expected Output and Time scale

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| 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* | *24.514* | *Ranging based services and sidelink positioning in 5G system(5GS);* *system(5GS);* *Stage 3* | TSG CT#102*(December 2023)* | TSG CT#103*(March 2024)* | *CT1**Tingfang Tang,* *Xiaomi,* *tangtingfang@xiaomi.com* |
| *TS* | *29.XXX* | *5G System;**SideLink Positioning Key Management Services;**Stage 3* | TSG CT#102(December 2023) | TSG CT#103(March 2024) | *CT4**Tingfang Tang,* *Xiaomi,* *tangtingfang@xiaomi.com* |

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| 24.501 | Updates to 5GMM procedures to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT1 |
| 24.554 | Potential updates to 5G ProSe Model A and Model B Direct Discovery procedures to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT1 |
| 24.555 | Potential updates to 5G ProSe policies to support Ranging based services and sidelink positioning  | TSG CT #103 (March 2024) | CT1 |
| 24.571 | Potential updates to LCS MO-LR, NI-LR, MT-LR procedures to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT1 |
| 24.587 | Potential updates to V2X communication to support Ranging based services and sidelink positioning  | TSG CT #103 (March 2024) | CT1 |
| 24.588 | Potential updates to V2X policies to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT1 |
| 29.513 | Updates to the PCC procedure to support the provisioning of Ranging/SideLink Positioning service parameters by an AF and the policy and parameter provisioning to the UE and RAN. | TSG CT #103 (March 2024) | CT3 |
| 29.122 | Updates to the Nnef\_EventExposure API (via the SCEF MonitoringEvent API) to support the exposure of Ranging based services and SideLink Positioning services to an AF. | TSG CT #103 (March 2024) | CT3 |
| 29.522 | 1. Updates to the NEF northbound interface (i.e. Nnef\_EventExposure API reusing the eLCS feature) to support the exposing of Ranging based services and sidelink positioning services to an AF.2. Updates to the NEF northbound interface (i.e. Nnef\_ServiceParameter API) to support the provisioning of Ranging/SideLink Positioning service parameters by an AF.3. Updates to the NEF northbound interface (i.e. a new API) to support the mapping between application layer ID and GPSI consumed by an GMLC. | TSG CT #103 (March 2024) | CT3 |
| 29.591 | Updates to the NEF interface to support the mapping between application layer ID and GPSI consumed by an GMLC. | TSG CT #103 (March 2024) | CT3 |
| 29.525 | Updates to PCF to support service authorisation policy and parameters provisioning in Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT3 |
| 29.519 | Updates to the UDR to support the provisioning and storage of Ranging/SideLink Positioning service parameters. | TSG CT #103 (March 2024) | CT3 |
| 24.080 | Potential updates to Supplementary services specification to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT4 |
| 29.503 | Potential updates to UDM to support subscription to Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT4 |
| 29.504 | Potential updates to UDR to support subscription to Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT4 |
| 29.505 | Potential updates to UDR to support subscription to Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT4 |
| 29.510 | Potential updates to NRF to support Ranging based services and sidelink positioning  | TSG CT #103 (March 2024) | CT4 |
| 29.515 | Potential updates to GMLC to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT4 |
| 29.518 | Potential updates to AMF to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT4 |
| 29.571 | Potential updates to define new common data types | TSG CT #103 (March 2024) | CT4 |
| 29.572 | Potential updates to LMF to support Ranging based services and sidelink positioning | TSG CT #103 (March 2024) | CT4 |

# 6 Work item Rapporteur(s)

Tingfang Tang, Xiaomi, tangtingfang@xiaomi.com

# 7 Work item leadership

CT1

# 8 Aspects that involve other WGs

SA3 for the Security aspects, SA5 for the charging aspects

# 9 Supporting Individual Members

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| Supporting IM name |
| Apple |
| AT&T |
| CATT |
| China Mobile |
| Deutsche Telekom |
| Huawei |
| HiSilicon |
| Intel |
| Interdigital |
| LG Electronics |
| MATRIXX Software |
| MediaTek Inc |
| OPPO |
| Philips |
| Qualcomm Incorporated |
| Samsung |
| Sony |
| Tencent |
| Toyota |
| vivo |
| Xiaomi |
| ZTE |