**3GPP SA WG2 Meeting #155 S2-230**

**Athens, Feb 20 - 24, 2023 (Revision of SP-221133)**

**Source: Xiaomi**

**Title: Revised WID on Architecture Enhancement to support Ranging based services and sidelink positioning (Ranging\_SL)**

**Document for: Approval**

**Agenda Item: 10.3**

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: Architecture Enhancement to support Ranging based services and Sidelink Positioning

Acronym: Ranging\_SL

Unique identifier: 980015

{A number to be provided by MCC at the plenary}

Potential target Release: Rel-18

# 1 Impacts

{For Normative work, identify the anticipated impacts. For a Study, identify the scope of the study}

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

# 2 Classification of the Work Item and linked work items

## 2.1 Primary classification

|  |  |
| --- | --- |
| X | Feature |
|  | Building Block |
|  | Work Task |
|  | Study Item |

## 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) |
| FS\_Ranging | SA1 | 880039 | Study on Ranging-based Services |
| Ranging | SA1 | 910034 | Stage 1 for Ranging |
| V2XIMP | SA1 | 820024 | Improvement of V2X service Handling |
| FS\_NR\_pos\_cov | RAN | 880075 | Study on scenarios and requirements of in-coverage, partial coverage, and out-of-coverage NR positioning use cases |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work /Study Items (if any) |
| Unique ID | Title | Nature of relationship |
| 940069 | Study on Ranging based services and sidelink positioning | Study on CN aspects of Ranging based services and sidelink positioning |
| 940081 | Study on expanded and improved NR positioning | Study on RAN aspects of Ranging and Sidelink Positioning |
| 960036 | Study on Security Aspects of Ranging Based Services and Sidelink Positioning | Study on Security Aspects of Ranging Based Services and Sidelink Positioning |

Dependency on non-3GPP (draft) specification:

# 3 Justification

Ranging based services and Sidelink Positioning can be used for commercial, V2X and public safety use cases in in-coverage, partial coverage, and out-of-coverage of 5G network. To support those use cases, FS\_Ranging\_SL has studied the 5GS architecture enhancements for the following work tasks:

- Authorization and policy/parameter provisioning for a UE or a group of UEs;

- Ranging device discovery and service operation procedures between two UEs, between one UE and multiple UEs or via the assistance of another UE;

- Ranging and sidelink positioning service exposure to a UE or an Application Server who has requested the service.

This work item is to specify the architecture enhancements that have been concluded in TR 23.700-86 as a result of the FS\_Ranging\_SL study.

# 4 Objective

The objective is to specify 5GS architecture enhancements based on conclusions reached within TR 23.700-86 for the following aspects:

- The principle, the necessary and additional information and the procedures for service authorisation and (pre-) configuration/provisioning to the UE and to the NG-RAN.

- The support of ranging service operation procedures including both Network-assisted Operation and UE-only Operation for In Network Coverage, Partial Network Coverage and Out of Network Coverage cases to perform ranging between two UEs or between one and multiple UEs with direct connection with each other or with the assistance by one or multiple Assistant UEs when direct connection is not feasible.

- Discovery of SL Reference UE, Target UE, Assistant UE and SL Positioning Server UE for performing Ranging based service and Sidelink Positioning

- Control of Operations for Ranging/Sidelink Positioning, including coordination and configuration information exchanged between the UEs, the control signalling procedure to exchange the coordination & configuration information and the Ranging/Sidelink Positioning signals measurement results between the UEs, the functionality of upper layers, and parameters exchanged between the upper layers and AS layer for Ranging/ Sidelink Positioning.

- Support for Network assisted Sidelink Positioning for In Network Coverage and Partial Network Coverage.

- Support for Ranging and Sidelink Positioning service exposure including triggering Ranging and Sidelink Positioning between two UEs and exposure of the result to the initiating party.

- Ranging and Sidelink Positioning service exposure to a UE

- Ranging/Sidelink Positioning service exposure to Application server or 5GC NF

NOTE 1: Privacy protection and other security aspects will be tasked to SA3, and the related impacts to architecture enhancement will be based on SA3 conclusion.

NOTE 2: Architectural implications to RAN or RAN dependent aspects will be coordinated with RAN WGs.

# 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 |
| New TS  | TS 23.586 | Architectural Enhancements to support Ranging based services and Sidelink Positioning  |  SA#100 (June 2023) |  SA#100 (June 2023) | Shen, Sherry (Yang), Xiaomi, shenyang6@xiaomi.com |

NOTE: The new TS will specify architectural reference model, basic functionalities and procedures related to UE discovery, Parameter/Policy Authorization and Provisioning, and operations over PC5.

|  |
| --- |
| Impacted existing TS/TR {One line per specification. Create/delete lines as needed} |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| 23.304 | Potential impact to support UE discovery and Parameter/Policy Authorization and Provisioning | SA#100 (June 2023) |  |
| 23.287 | Potential impact to support UE discovery and Parameter/Policy Authorization and Provisioning | SA#100 (June 2023) |  |
| 23.273 | Procedures with the involvements of network NFs for location services. | SA#100 (June 2023) |  |
| 23.501 | Update to architecture reference model and potential updates to NF and NF services. | SA#100 (June 2023) |  |
| 23.502 |  Ranging/Sidelink Positioning Subscription data | SA#100 (June 2023) |  |
| 23.503 | UE policy control to support Ranging/Sidelink Positioning  | SA#100 (June 2023) |  |

# 6 Work item Rapporteur(s)

Shen, Sherry (Yang), Xiaomi, shenyang6@xiaomi.com

# 7 Work item leadership

SA2

# 8 Aspects that involve other WGs

SA3 for the Security aspects, SA5 for the Charging aspects, RAN for the RAN related issues.

# 9 Supporting Individual Members

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