**3GPP TSG SA Meeting #87E SP-200239**

**Elbonia, March 17 – 20, 2020 (revision of SP-190443)**

**Source: CATT, OPPO**

**Title: Revised SID: Study on System enhancement for Proximity based Services in 5GS**

**Document for: Approval**

**Agenda Item: 6.5**

**Abstract: The SID (SP-190443) is revised based on endorsed FS\_5G\_ProSe Work Task (SP-191371) at SA#86.**

3GPP™ Work Item Description

For guidance, see [3GPP Working Procedures](http://www.3gpp.org/About/WP.htm), article 39; and [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm).
Comprehensive instructions can be found at <http://www.3gpp.org/Work-Items>

# Title: Study on System enhancement for Proximity based Services in 5GS

## Acronym: FS\_5G\_ProSe

## Unique identifier: 830033

## 1 Impacts

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

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a …

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

### 2.2 Parent and child Work Items

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| --- |
| Parent and child Work Items  |
| Unique ID | Title | Nature of relationship |
|  |  |  |
|  |  |  |

### 2.3 Other related Work Items and dependencies

*{List here other Work Items which relate to the proposed one but are not part of the hierarchical structure.}*

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| 320022 | Requirements for evolution of the 3GPP system architecture | SA1 work item to define requirements for LTE/EPS, which contains proximity services requirements. |
| 790001 | New Services and Markets Technology Enablers – Phase 2 | SA1 work item to define requirements for 5GS, which contains proximity services requirements. |
| 780002 | Removal of 'over LTE' limitation from Mission Critical Specifications | The requirements specified in 3GPP stage 1. |
| 800023 | Study on Mission Critical services support over 5G System | SA6 study item to support mission critical services over 5GS. |
| 800015 | Study on Network Controlled Interactive Service in 5GS | SA1 study item, which studies new services requirements related to proximity services. |
| 840030 | WID on Network Controlled Interactive Service(NCIS) Requirements  | SA1 work item, which specifies the requirements for interactive service. |
| 860042 | WID on NR Sidelink enhancement | RAN work item, which specifies enhancements of NR Sidelink. |
| 860038 | Study on NR Sidelink relay | RAN study item, which studies NR Sidelink Relay. |

## 3 Justification

Proximity Services has been developed in EPS from Rel-12 to support both commercial and public safety services. In Rel-14, the Proximity Services (specifically the direct communication) has been enhanced to support V2X services over LTE.

For 5GS, the proximity services are expected to be an important system wide enabler to support various applications and services. In Rel-16 the PC5 based architecture and communications are developed to support advanced V2X services. However, there are more proximity related service requirements than service requirements covered by the existing Rel-16 SA2 work, e.g. eV2XARC. For example, the SA WG6 identified that the direct mode, D2D, communication mechanisms, including UE-to-Network Relay, are lacking in 5GS, creating a significant gap to enable Mission Critical services over 5GS (details please refer to S6-190280, LS out to RAN and SA). There are other upcoming applications that rely on the proximity services.

The SA1 Study on Network Controlled Interactive Service in 5GS (i.e. FS\_NCIS) studies the new proximity related use cases and potential services requirements for interactive services, which could be found in TR 22.842 to explore PC5 communication to maximise the spectrum utilization of frequency resource.

As such, the 5G System needs to be enhanced to support the proximity based services with one common architecture to take advantage of economy of scale, i.e. such architecture can be used for both public safety and commercial related proximity services, where applicable.

## 4 Objective

This Study Item is to identify and evaluate potential enhancements to the 5G System architecture to support proximity based services based on SA1 requirements defined in TS 22.278 and TS 22.261.

To develop a common framework for supporting proximity based services (to satisfy service requirements defined for both public safety and commercial proximity services), the following needs to be performed:

- a gap analysis between existing Rel-16 5GS architectures, functionalities, procedures and the requirements of proximity based services, to identify what is fulfilled and what is missing. Both non-roaming and roaming scenarios should be considered.

In addition, two sets of objectives will be pursued pertaining to specifically commercial and public safety related services:

**Set A: System enhancements to support Public Safety related proximity services:**

Based on the common framework, this part focuses on system enhancements to support service requirements defined for public safety services, which mainly includes:

* Suppport of one-to-many direct communication including out-of-coverage;
* Support of one-to-one direct communication including out-of-coverage;
* Support of UE-to-Network Relay (including QoS aspects); This objective needs to take commercial services into account.
* Support of direct discovery including out-of-coverage;

- Support of UE-to-UE relay mechanism*.* This objective needs to take commercial services into account.

**Set B: System enhancements to support commercial related proximity services:**

Based on the common framework, this part focuses on the commercial specific proximity services, which mainly includes:

* + System enhancement to support NCIS related service requirements, which mainly includes:
* Support of PC5 direct communication, including unicast, groupcast.
* Support of group management, discovery for the interactive services on PC5 interface.
* Support of authorization for PC5 direct communication, including, e.g. authorizing communication with or without a group.
* Support of QoS ehnhancement for a variety of services on PC5 interface, e.g. high data rate and/or low latency transmission.
* Support of network controlled path selection and path switching between Uu interface and PC5 interface. The path switching of user traffic shall minimize user experience interruption. Path switching between a 5GC path and a direct PC5 path between two UEs is not in scope.
* Support of the mechanism for operator to charge PC5 communication, including, e.g. per group basis, per individual UE basis.

This study will also consider related architecture impact identified by the SA6 Study, Study on Mission Critical services support over 5G System (FS\_MCOver5GS).

This study will consider to use existing solutions as much as possible, e.g. PC5 based architecture and communications specified in R16 V2X as a basis, etc.

Architectural implications for RAN will be coordinated with RAN WGs.

As much as possible the study shall strive towards common solutions between Set A and Set B;

## 5 Expected Output and Time scale

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| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Proposed Spec no. or series | Type (see note 1)  | Rapporteur(s)(see note 2) | For info at TSG#  | For approval at TSG# | Remarks |
| *New TR 23.752* | *Internal TR* | *Qiang Deng, CATT (dengqiang1@catt.cn) Jianhua Liu, OPPO**(liujianhua@oppo.com)* | *TSG#88 (June 2020)* | *TSG#88 (June 2020)* | *Secondary Rapporteur* *is responsible for Set B objective.* |

Note 1: Only TSs may contain normative provisions. Study Items shall create or impact only TRs.
“Internal TR” is intended for 3GPP internal use only whereas “External TR” may be transposed by Ops.

Note 2: The first listed Rapporteur is the specification primary Rapporteur. Secondary Rapporteur(s) are possible for particular aspect(s) of the TS/TR. In this case, their responsibility has to be provided as “Remarks”.

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## 6 Work item Rapporteur(s)

Qiang Deng, CATT, dengqiang1@catt.cn;

Jianhua Liu, OPPO, liujianhua@oppo.com;

## 7 Work item leadership

SA2.

## 8 Aspects that involve other WGs

Security aspects (if any) will be addressed by SA3.

## 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| CATT |
| OPPO |
| China Telecom |
| Telecom Italia |
| CAICT |
| Tencent |
| ZTE |
| China Unicom |
| TD Tech Ltd |
| KPN |
| Convida Wireless |
| Huawei |
| HiSilicon |
| ITRI |
| Xiaomi |
| Qualcomm Incorporated |
| China Mobile  |
| Vivo |
| NEC |
| AT&T |
| Verizon UK Ltd |
| Interdigital |
| Motorola Mobility |
| Lenovo |
| Telstra |
| Samsung |
| Ericsson  |
| Intel |
| SES S.A. |
| MediaTek Inc. |
| LG Electronics |
| Spreadtrum |