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| **3GPP TSG- Meeting #**  **, , -**   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *CR-Form-v12.3* | | | | | | | | | | **CHANGE REQUEST** | | | | | | | | | |  | | | | | | | | | |  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  | |  | | | | | | | | | | *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | | |

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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | LI for 5G ProSe Direct Communication - Stage 2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | SA3LI (Ministère Economie et Finances) | | | | | | | | | |
| ***Source to TSG:*** | SA3 | | | | | | | | | |
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| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
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| ***Category:*** |  |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Absence of LI for 5G ProSe Direct Communication in Stage 2 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add LI for 5G ProSe Direct Communication in Stage 2 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The LI for 5G ProSe Direct Communication in Stage 2 would still be missing | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 3.3, 7.X, Annex X (informative) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | s3i250018 | | | | | | | | |

START OF FIRST CHANGE

# 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*.

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

[2] 3GPP TS 23.501: "System Architecture for the 5G System".

[3] 3GPP TS 33.126: "Lawful interception requirements".

[4] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[5] 3GPP TS 23.271: "Functional stage 2 description of Location Services (LCS)".

[6] OMA-TS-MLP-V3\_5-20181211-C: "Open Mobile Alliance; Mobile Location Protocol, Candidate Version 3.5", <https://www.openmobilealliance.org/release/MLS/V1_4-20181211-C/OMA-TS-MLP-V3_5-20181211-C.pdf>".

[7] ETSI TS 103 120: "Lawful Interception (LI); Interface for warrant information".

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[9] 3GPP TS 33.501: "Security Architecture and Procedures for the 5G System".

[10] ETSI GR NFV-SEC 011: "Network Functions Virtualisation (NFV); Security; Report on NFV LI Architecture".

[11] 3GPP TS 33.107: "3G Security; Lawful interception architecture and functions".

[12] 3GPP TS 23.214: "Architecture enhancements for control and user plane separation of EPC nodes; Stage 2".

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[14] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[15] 3GPP TS 33.128: "Protocol and Procedures for Lawful Interception; Stage 3".

[16] ETSI TS 103 221-2: " Lawful Interception (LI); Internal Network Interfaces; Part 2: X2/X3".

[17] MMS Architecture OMA-AD-MMS-V1\_3-20110913-A.

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Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".

[23] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

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[25] OMA-AD-PoC-V2\_1-20110802-A: "Push to talk over Cellular (PoC) Architecture".

[26] GSMA IR.92: "IMS Profile for Voice and SMS".

[27] GSMA NG.114: "IMS Profile for Voice, Video and Messaging over 5GS".

[28] 3GPP TS 24.147: "Conferencing using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3".

[29] ETSI GS NFV-SEC 012: "Network Functions Virtualisation (NFV) Release 3; Security; System architecture specification for execution of sensitive NFV components".

[30] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[31] 3GPP TS 29.522: "5G System; Network Exposure Function Northbound APIs; Stage3".

[32] 3GPP TS 29.122: "T8 reference point for Northbound APIs".

[33] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications".

[34] OMA-AD-CPM-V2\_2-20170926-C: "Open Mobile Alliance, OMA Converged IP Messaging System Description", <http://www.openmobilealliance.org/release/CPM/V2_2-20200907-C/OMA-AD-CPM-V2_2-20170926-C.pdf>.

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[36] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".

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[43] IETF RFC 7095: "jCard: The JSON Format for vCard".

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[48] 3GPP TS 33.220: "Generic Authentication Architecture (GAA); Generic Bootstrapping Architecture (GBA)".

[49] 3GPP TS 33.222: "Generic Authentication Architecture (GAA); Access to network application functions using Hypertext Transfer Protocol over Transport Layer Security (HTTPS)".

[50] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[51] 3GPP TS 23.558: "Architecture for enabling Edge Applications".

[52] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[53] 3GPP TS 26.501: "5G Media Streaming (5GMS); General description and architecture".

[54] 3GPP TS 29.272: "Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol".

[55] 3GPP TS 23.288: "Architecture enhancements for 5G System (5GS) to support network data analytics services".

[56] 3GPP TS 38.455: "NR Positioning Protocol A (NRPPa)".

[57] 3GPP TS 36.455: "LTE Positioning Protocol A (LPPa)".

[58] 3GPP TS 23.140: "Multimedia Messaging Protocol. Functional Description. Stage 2".

[X] 3GPP TS 32.303: "Proximity-based services (ProSe); Stage 2".

[Y] 3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS)".

[Z] 3GPP TS 32.277: "Proximity-based Services (ProSe) charging".

END OF FIRST CHANGE

START OF SECOND CHANGE

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP 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 3GPP TR 21.905 [1].

5GC 5G Core Network

5GMS 5G Media Streaming

5GS 5G System

AAnF AKMA Anchor Function

AC Application Client

ACR Application Context Relocation

ADMF LI Administration Function

AF Application Function

AF\_ID Application Function Identity

AKA Authentication and Key Agreement

A-KID AKMA Key IDentifier

AKMA Authentication and Key Management for Applications

AMF Access and Mobility Management Function

AS Application Server

AUSF Authentication Server Function

BBIFF Bearer Binding Intercept and Forward Function

BSS Business Support System

CAG Closed Access Group

CC Content of Communication

CP Control Plane

CP NF Control Plane Network Function

CPIM Common Presence and Instant Messaging

CPS Call Placement Service

CSI Cell Supplemental Information

CSP Communication Service Provider

CSR Cell Site Report

CUPS Control and User Plane Separation

DC-AS Data Channel Application Server

DCSF Data Channel Signalling FunctionDDNMF Direct Discovery Name Management Function

DN Data Network

DNAI Data Network Access Identifier

DoNAS Data over NAS

EAP Extensible Authentication Protocol

EAS Edge Application Server

ECGI E-UTRAN Cell Global Identifier

eCNAM Enhanced Calling Name

ECSP Edge Computing Service Provider

E-CSCF Emergency – Call Session Control Function

EDN Edge Data Network

EEC Edge Enabler Client

EECID Edge Enabler Client IDentifier

EES Edge Enabler Server

eIMS-AGW enhanced IMS-AGW

eP-CSCF enhanced P-CSCF

GPSI Generic Public Subscription Identifier

HMEE Hardware Mediated Execution Enclave

HR Home Routed

IBCF Interconnection Border Control Functions

ICF Identity Caching Function

IEF Identity Event Function

IMS-AGW IMS Access Gateway

IMS-HSS HSS supporting IMS services for 5GC

IM-MGW IM Media Gateway

IP Interception Product

IPPR Internet Protocol Packet Reporting

IQF Identity Query Function

IRI Intercept Related Information

KAF AKMA Application Key

KAKMA AKMA Anchor Key

KID Key IDentifier

KLI Decryption key(s) for services encrypted by CSP-provided keys

KSF Key Server Function

LAF Location Acquisition Function

LALS Lawful Access Location Services

LARF Location Acquisition Requesting Function

LBO Local Break Out

LEA Law Enforcement Agency

LEMF Law Enforcement Monitoring Facility

LI Lawful Interception

LI CA Lawful Interception Certificate Authority

LICF Lawful Interception Control Function

LI\_HI1 Lawful Interception Handover Interface 1

LI\_HI2 Lawful Interception Handover Interface 2

LI\_HI3 Lawful Interception Handover Interface 3

LI\_HI4 Lawful Interception Handover Interface 4

LI\_HILA Lawful Interception Handover Interface Location Acquisition

LI\_HIQR Lawful Interception Handover Interface Query Response

LIID Lawful Interception Identifier

LIPF Lawful Interception Provisioning Function

LIR Location Immediate Request

LI\_SI Lawful Interception System Information Interface

LISSF Lawful Interception State Storage Function

LI\_ST Lawful Interception State Transfer Interface

LI\_T1 Lawful Interception Internal Triggering Interface 1

LI\_T2 Lawful Interception Internal Triggering Interface 2

LI\_T3 Lawful Interception Internal Triggering Interface 3

LI\_X0 Lawful Interception Internal Interface 0

LI\_X1 Lawful Interception Internal Interface 1

LI\_X2 Lawful Interception Internal Interface 2

LI\_X2\_LA Lawful Interception Internal Interface 2 Location Acquisition

LI\_X3 Lawful Interception Internal Interface 3

LI\_X3A Lawful Interception Internal Interface 3 Aggregator

LI\_XEM1 Lawful Interception Internal Interface Event Management Interface 1

LI\_XER Lawful Interception Internal Interface Event Record

LI\_XLA Lawful Interception Internal Interface Location Acquisition

LI\_XQR Lawful Interception Internal Interface Query Response

LMF Location Management Function

LMISF LI Mirror IMS State Function

LMISF-CC LMISF for the handling of CC

LMISF-IRI LMISF for the handling of IRI

LTF Location Triggering Function

MA Multi-Access

MANO Management and Orchestration

MDF Mediation and Delivery Function

MDF2 Mediation and Delivery Function 2

MDF3 Mediation and Delivery Function 3

MF Media Function

MRFP Multimedia Resource Function Processor

MSRP Message Session Relay Protocol

N3A Non-3GPP Access

N3IWF Non 3GPP Inter Working Function

N9HR N9 Home Routed

NAS Non-Access Stratum

NCGI NR Cell Global Identity

NEF Network Exposure Function

NFV Network Function Virtualisation

NFVI Network Function Virtualisation Infrastructure

NFVO Network Function Virtualisation Orchestrator

NIDD Non-IP Data Delivery

NNI Network to Network Interfaces

NPLI Network Provided Location Information

NR New Radio

NRF Network Repository Function

NSSF Network Slice Selection Function

NWDAF Network Data Analytics Function

OSS Operations Support System

PAG POI Aggregator

PCF Policy Control Function

P-CSCF Proxy - Call Session Control Function

PEI Permanent Equipment Identifier

PGW PDN Gateway

PGW-C PDN Gateway Control Plane

PGW-U PDN Gateway User Plane

POI Point Of Interception

PLMN Public Land Mobile Network

ProSe Proximity based Services

PTC Push to Talk over Cellular

RCD Rich Call Data

RCS Rich Communication Suite

S8HR S8 Home Routed

SCEF Service Capability Exposure Function

SCS Service Capability Server

SGW Serving Gateway

SGW-C Serving Gateway Control Plane

SGW-U Serving Gateway User Plane

SHAKEN Signature-based Handling of Asserted information using toKENs

SIRF System Information Retrieval Function

S-CSCF Serving - Call Session Control Function

SIP Session Initiation Protocol

SMF Session Management Function

SMSF SMS-Function

STF Security Terminating Function

STIR Secure Telephony Identity Revisited

SUCI Subscriber Concealed Identifier

SUPI Subscriber Permanent Identifier

TAI Tracking Area Identity

TF Triggering Function

TLS Transport Layer Security

TNGF Trusted Non-3GPP Gateway Function

TrGW Transit Gateway

TWIF Trusted WLAN Interworking Function

UDM Unified Data Management

UDR Unified Data Repository

UDSF Unstructured Data Storage Function

UPF User Plane Function

VN Group Virtual Network Group

VNF Virtual Network Function

VNFC Virtual Network Function Component

W-AFG Wireline Access Gateway Function

WAF WebRTC Authorisation Function

WIC WebRTC IMS Client

WWSF WebRTC Web Server Function

xCC LI\_X3 Content of Communication

xIRI LI\_X2 Intercept Related Information

END OF SECOND CHANGE

START OF THIRD CHANGE

## 7.X LI at DDNMF

### 7.X.1 Background

ProSe (Proximity-based Services) provides mechanisms for devices to discover other devices in close proximity and to communicate with other devices directly, i.e., without the data path being routed via the network infrastructure. Functions and capabilities introduced by ProSe can be used by any application running on top of a ProSe-enabled UE.

5G DDNMF (Direct Discovery Name Management Function) is the function handling network related actions required for dynamic 5G ProSe Direct Discovery.

A UE only interacts with the DDNMF in its HPLMN to get ProSe service authorizations. The 5G DDNMF in the HPLMN may interact with the 5G DDNMF in a VPLMN or Local PLMN in order to manage the 5G ProSe Direct Discovery service. The Local PLMN is a PLMN in which the "monitoring" UE is authorized by the HPLMN to use radio resources to engage in ProSe Direct Discovery (see TS 23.303 [X] clause 3.1). The Local PLMN is not the same as the serving PLMN (HPLMN or VPLMN) of the UE. Final authorization of the UE is always performed by the DDNMF in the HPLMN.

### 7.X.2 Architecture

Figure 7.X.2-1 gives a reference point representation of the LI architecture with 5G DDNMF as a CP NF providing the IRI-POI function. The 5G DDNMF in the HPLMN may interact with the 5G DDNMF in a VPLMN or Local PLMN in order to authorize the 5G ProSe Direct Discovery service. This LI architecture is valid for a 5G DDNMF in the HPLMN, VPLMN and Local PLMN.



Figure 7.X.2-1: LI architecture for 5G ProSe showing LI at 5G DDNMF

NOTE: The 5G DDNMF in the VPLMN and 5G DDNMF in the Local PLMN are also referred as 5G DDNMF.

### 7.X.3 Target identities

The LIPF present in the ADMF provisions the intercept information associated with the following target identities to the IRI-POI present in the 5G DDNMF:

- SUPI.

- GPSI.

### 7.X.4 IRI events

The IRI-POI in the 5G DDNMF in the home PLMN (HPLMN) shall generate xIRI when it detects the following specific event or information:

- ProSe UNI direct discovery (see TS 23.304 [Y] clause 6.3 and TS 32.277 [Z] clause 5.4.2.7).

The IRI-POIs present in the 5G DDNMF in the HPLMN, VPLMN and local PLMN shall generate xIRI when they detect the following specific event or information:

- ProSe NNI direct discovery (see TS 23.304 [Y] clause 7.1).

The ProSe UNI direct discovery xIRI is generated when the IRI-POI present in the 5G DDNMF in the HPLMN detects that a target UE is requesting authorization from 5G DDNMF of its HPLMN to engage in 5G ProSe Direct Discovery

The ProSe NNI direct discovery xIRI is generated when the IRI-POI present in the 5G DDNMF in the HPLMN/VPLMN/Local PLMN detects that the DDNMF in the HPLMN invokes the DDNMF in VPLMN or Local PLMN to requests authorization for the target UE to engage in 5G ProSe Direct Discovery in the VPLMN or Local PLMN. END OF THIRD CHANGE

END OF FOURTH CHANGE

Annex X (informative):  
ProSe Direct Discovery operation

# X.1 General

This annex defines ProSe (Proximity-based services) direct discovery and its operation.

# X.2 ProSe Direct Discovery

## X.2.1 ProSe Direct Discovery operation

5G ProSe Direct Discovery is defined as the procedure used by the ProSe-enabled UE to discover other ProSe-enabled UE(s) in its proximity using NR direct radio signals using the PC5 interface without going via the network.

Two possible Direct Discovery models exist:

- Model A ("I am here"): In this model, the UE announces its presence to other UE(s) who are interested in reading and/or processing the messages. The UE that announces certain information that could be used by other UE(s) in proximity is called the "announcing" UE. The UE that has the permission to discover and the interest to read and/or process messages from an "announcing" UE in proximity is called the "monitoring" UE.

- Model B ("who is there" and/or "are you there"): In this model, the UE tries to discover other UE(s) by sending a request containing certain information. The UE that transmits a request containing certain information about what it is interested to discover is called the "discoverer" UE. The UE that receives and processes the request message and responds with some information related to the discoverer's request is called the "discoveree" UE.

The ProSe Discovery feature is defined in an "open" mode and in a "restricted" mode. For the open mode, no permission is needed from the UE that is to be discovered, while the restricted mode requires permission from the UE that is being discovered.

A UE may be:

- An announcing UE requesting the DDNMF ProSe application code(s) to be announced over 5G ProSe-enabled radio interface (PC5) to UEs in proximity or informing the 5G DDNMF that the UE wants to stop announcing Prose application code.

- A monitoring UE requesting to the DDNMF the discovery filter(s) corresponding to a ProSe application ID to perform direct discovery monitoring corresponding to this ProSe application ID or informing the 5G DDNMF that the UE wants to stop using discovery filter(s) for direct discovery monitoring.

- A discoverer UE requesting query code (s) and discovery response filter(s) to its DDNMF to be used for sending query and monitoring responses over the PC5 interface respectively.

- A discoveree UE requesting discovery query filter(s) to its DDNMF to be used for monitoring query sent by discoverer UE over the PC5 interface and ProSe response code to be announced over the PC5 interface as a response to the query.

Figure X.2.1-1 shows Direct Discovery procedure for Model A in an open mode.

When the UE announces its presence, it initiates a discovery request for announcing to the DDNMF in its HPLMN. The discovery request contains the ProSe Application ID of the application whose availability is intended to be announced.

If the request is successful, it obtains the ProSe Application Code from the 5G DDNMF in its HPLMN.

The ProSe Application Code is a temporary code that corresponds to the ProSe Application ID and it is UE specific. It is used to enable monitoring UE to discover the presence of the announcing UE. Each ProSe Application Code is composed from a temporary identity and a PLMN ID that corresponds to the PLMN that assigned the ProSe Application Code.

The UE uses the Application Code for the announcing procedure over the PC5 interface.

When the UE is triggered by an application to monitor for other UEs that are in proximity and it has the authorization to monitor, it initiates a discovery request for monitoring towards the DDNMF in its HPLMN. The request includes the Application ID.

If the request is successful, it obtains the Discovery Filter(s). A Discovery Filter is a container of a ProSe Application code, zero or more ProSe Application Mask(s) and Time To Live value.

Then the monitoring UE starts monitoring for these ProSe Application Code(s) on the PC5 interface.

When the UE detects that one or more advertised ProSe Application Code(s) match the given filter, it reports these ProSe Application Code(s) to the ProSe Function using a Match report.



Figure X.2.1-1: High level Direct Discovery procedure

The overall procedure for 5G ProSe Direct Discovery (Model A) is described in TS 23.304 [Y] clause 6.3.1.2. The overall procedure for 5G ProSe Direct Discovery (Model B) is described in TS 23.304 [Y] clause 6.3.1.3.

If the UE wants to announce in a VPLMN, the announcing UE sends a discovery request containing the ProSe Application ID to the 5G DDNMF in its HPLMN in order to be allowed to announce an Application Code on its serving PLMN (i.e., VPLMN). If the announcing UE wants to send announcements in the VPLMN, it needs to be authorized from the 5G DDNMF in the VPLMN. The 5G DDNMF in the HPLMN requests authorization from the 5G DDNMF in the VPLMN. If authorization is granted, DDNMF in the HPLMN returns the code to the announcing UE.

If the monitoring UE wants to monitor in a VPLMN or local PLMN, the monitoring UE requests the discovery filters to the DDNMF in its HPLMN in order to be allowed to monitor on its serving PLMN (i.e., VPLMN, Local PLMN). The 5G DDNMF in the HPLMN requests authorization from the 5G DDNMF in the VPLMN or Local PLMN. If authorization is granted, DDNMF in the HPLMN returns the discovery filters to the monitoring UE.

END OF FOURTH CHANGE

END OF LAST CHANGE