**3GPP TSG-SA3 Meeting #81-LI-e-b *s3i210328r1***

**Online, , 19th May 2021 - 21st May 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **33.127** | **CR** | **0128** | **rev** | **1** | **Current version:** | **17.0.0** |  |
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| *For* [***HELP***](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:***  |  including NIDD |
|  |  |
| ***Source to WG:*** | SA3-LI (Ministère Economie et Finances, Nokia, Nokia Shanghai Bell) |
| ***Source to TSG:*** | SA3 |
|  |  |
| ***Work item code:*** | LI17 |  | ***Date:*** | 2021-05-14 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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 canbe 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | SCEF services including NIDD cannot be intercepted in EPS |
|  |  |
| ***Summary of change:*** | Adds stage 2 for SEF services in EPS including NIDD |
|  |  |
| ***Consequences if not approved:*** | Regulatory issue. LI for SCEF services including NIDD would continue to be missing in EPS |
|  |  |
| ***Clauses affected:*** | 2, 3, 7.X |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS 33.128 ... CR 0202...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | s3i210328r1 |

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 33.127: "Lawful Interception (LI) Architecture and Functions".

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

[7] ETSI TS 103 221-1: "Lawful Interception (LI); Internal Network Interfaces; Part 1: X1".

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

 [9] ETSI TS 102 232-1: "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 1: Handover specification for IP delivery".

[10] ETSI TS 102 232-7: "Lawful Interception (LI); Handover Interface and Service-Specific Details (SSD) for IP delivery; Part 7: Service-specific details for Mobile Services".

[11] 3GPP TS 33.501: "Security Architecture and Procedures for the 5G System".

[12] 3GPP TS 33.108: "3G security; Handover interface for Lawful Interception (LI)".

[13] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS)".

[14] 3GPP TS 24.007: "Mobile radio interface signalling layer 3; General Aspects".

[15] 3GPP TS 29.244: "Interface between the Control Plane and the User Plane nodes".

[16] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[17] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces; Stage 3".

[18] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".

[19] 3GPP TS 23.003: "Numbering, addressing and identification ".

[20] 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>.

[21] 3GPP TS 29.540: "5G System; SMS Services; Stage 3".

[22] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[23] 3GPP TS 38.413: "NG Application Protocol (NGAP)".

[24] 3GPP TS 29.572: "Location Management Services; Stage 3".

[25] 3GPP TS 29.503: "5G System; Unified Data Management Services".

[26] IETF RFC 815: "IP datagram reassembly algorithms".

[27] IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[28] IETF RFC 793: "Transmission Control Protocol".

[29] IETF RFC 768: "User Datagram Protocol".

[30] IETF RFC 4340: "Datagram Congestion Control Protocol (DCCP)".

[31] IETF RFC 4960: "Stream Control Transmission Protocol".

[32] IANA (www.iana.org): Assigned Internet Protocol Numbers, "Protocol Numbers".

[33] IETF RFC 6437: "IPv6 Flow Label Specification".

[34] IETF RFC 791: "Internet Protocol".

[35] Open Geospatial Consortium OGC 05-010: "URNs of definitions in ogc namespace".

[36] 3GPP TS 33.107: "3G security; Lawful interception architecture and functions".

[37] 3GPP TS 37.340: "Evolved Universal Radio Access (E-UTRA) and NR-Multi-connectivity; Stage 2".

[38] 3GPP TS 36.413: "S1 Application Protocol (S1AP)".

[39] OMA-TS-MMS\_ENC-V1\_3-20110913-A: "Multimedia Messaging Service Encapsulation Protocol".

[40] 3GPP TS 23.140: "Multimedia Messaging Protocol. Functional Description. Stage 2".

[41] 3GPP TS 38.415: "NG-RAN; PDU Session User Plane Protocol".

[42] 3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[43] IETF RFC 4566: "SDP: Session Description Protocol".

[44] 3GPP TS 24.193: "Stage 3: Access Traffic Steering, Switching and Splitting (ATSSS)".

[45] 3GPP TS 29.509: "5G System; Authentication Server Services; Stage 3".

[46] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[47] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[48] 3GPP TS 29.504: "5G System; Unified Data Repository Services; Stage 3".

[49] 3GPP TS 29.505: "5G System; Usage of the Unified Data Repository services for Subscription Data; Stage 3"

[XX] 3GPP TS 29.122: "T8 reference point for Northbound APIs".[XY] 3GPP TS 23.682: "Architecture enhancements to facilitate communications with packet data networks and applications5G System; Unified Data Management Services"

Second change

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

**Content of Communication (CC):** The content of communication as forwarded from the Mediation and Delivery Function 3 (over the LI\_HI3 interface) to the Law Enforcement Monitoring Facility.

**CUPS:** As defined in 3GPP TS 23.214 [12], represents PLMN with architecture enhancements for control and user plane separation of EPC nodes.

**Intercept Related Information (IRI):** The intercept related information as forwarded from the Mediation and Delivery Function 2 (over the LI\_HI2 interface) to the Law Enforcement Monitoring Facility.

**IRI event:** The network procedure or event that created an xIRI in the Point Of Interception.

**LI component:** The function and equipment involved in handling the Lawful Interception functionality in the CSP's network.

**Lawful Interception Identifier (LIID):** Unique identifier that associates a warrant to Lawful Interception Product delivered by the CSP to the LEA.

**LI system:** The collection of all LI components involved in handling the Lawful Interception functionality in the CSP's network.

**Non-local ID:** An identity assigned and managed at a different CSP than the CSP performing LI.

**Provisioning:** The action taken by the CSP to provide its Lawful Interception functions information that identifies the target and the specific communication services of interest to the LEA, sourced from the LEA provided warrant.

**Triggering:** The action taken by a dedicated function (Triggering Function) to provide another dedicated function (Triggered POI), that Provisioning could not directly be applied to, with information that identifies the specific target communication to be intercepted.

**Warrant:** The formal mechanism to require Lawful Interception from a LEA served to the CSP on a single target identifier. Depending on jurisdiction also known as: intercept request, intercept order, lawful order, court order, lawful order or judicial order (in association with supporting legislation).

**xCC:** The content of communication as forwarded from the Point Of Interception (over the LI\_X3) interface to the Mediation and Delivery Function 3.

**xIRI**: The intercept related information as forwarded from the Point Of Interception (over the LI\_X2) interface to the Mediation and Delivery Function 2.

## 3.2 Symbols

## 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

5GS 5G System

ADMF LI Administration Function

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

CSI Cell Supplemental Information

CSP Communication Service Provider

CUPS Control and User Plane Separation

DN Data Network

DNAI Data Network Access Identifier

E-CSCF Emergency – Call Session Control Function

GPSI Generic Public Subscription Identifier

HMEE Hardware Mediated Execution Enclave

HR Home Routed

IBCF Interconnection Border Control Functions

ICF Identifier Caching Function

IEF Identifier Event Function

IMS-AGW IMS Access Gateway

IM-MGW IM Media Gateway

IP Interception Product

IQF Identifier Query Function

IRI Intercept Related Information

LALS Lawful Access Location Services

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\_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

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\_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\_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

MRFP Multimedia Resource Function Processor

N9HR N9 Home Routed

N3IWF Non 3GPP Inter Working Function

NFV Network Function Virtualisation

NFVI Network Function Virtualisation Infrastructure

NFVO Network Function Virtualisation Orchestrator

NIDD Non-IP Data Delivery

NPLI Network Provided Location Information

NR New Radio

NRF Network Repository Function

NSSF Network Slice Selection 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-U PDN Gateway User Plane

POI Point Of Interception

PLMN Public Land Mobile Network

PTC Push to Talk over Cellular

S8HR S8 Home Routed

SCEF Service Capability Exposure Function

SCS Service Capability Server

SIRF System Information Retrieval Function

S-CSCF Serving - Call Session Control Function

SMF Session Management Function

SMSF SMS-Function

SUCI Subscriber Concealed Identifier

SUPI Subscriber Permanent Identifier

TF Triggering Function

TrGW Transit Gateway

UDM Unified Data Management

UDR Unified Data Repository

UDSF Unstructured Data Storage Function

UPF User Plane Function

VNF Virtual Network Function

VNFC Virtual Network Function Component

xCC LI\_X3 Communications Content

xIRI LI\_X2 Intercept Related Information

Third change

## 7.X Non-IP data delivery (NIDD) in EPS

### 7.X.1 Background

#### 7.X.1.1 General

Functions for NIDD (Non-IP Data Delivery) may be used to handle Mobile Originated (MO) and Mobile Terminated (MT) communication for unstructured data (also referred to as Non-IP). Such delivery to the SCS/AS (Service Capability Server/ Application Server) is accomplished by one of the following two mechanisms as defined in TS 23.682 [XY] clause 4.5.14:

- Delivery using SCEF.

- Delivery using a Point-to-Point (PtP) SGi tunnel.

If the subscription includes a "SCEF Identity for NIDD" corresponding with the APN information, then the MME selects that SCEF and uses the T6a interface to that SCEF, otherwise, the MME selects a SGW and PGW which handle this PDN connection. The PDN GW shares a SGi tunnel with the SCS/AS for the NIDD traffic exchange. If SCEF is used, the NIDD traffic is forwarded by SCEF to the SCS/AS.NIDD applies to non-roaming and roaming with home-routed roaming architecture.

#### 7.X.1.2 NIDD in non-roaming situation

##### 7.X.1.2.1 Delivery using SCEF

Figure 7.X-XA presents the architecture for delivery of NIDD using SCEF in non-roaming scenario. NIDD using SCEF requires a control plane PDN connection. The PDN connection is established between UE and SCEF via MME. The user traffic (i.e., NIDD traffic) is exchanged with DoNAS (Data over NAS) between UE and MME, then over T6a interface between MME and SCEF and finally over T8 interface between SCEF and SCS/AS.



**Figure 7.X-XA: EPS Architecture for NIDD using SCEF**

##### 7.X.1.2.2 Delivery using a PtP SGi tunnel

Figure 7.X-XB shows the architecture for delivery of NIDD using a PtP SGi tunnel in non-roaming scenario. The user traffic is exchanged with DoNAS between UE and MME, over S11 interface between MME and SGW, over S5 interface between SGW and PGW and finally over a PtP SGi tunnel between PGW and AF. The tunnel is typically a UDP/IP tunnel.



**Figure 7.X-XB: EPS Architecture for NIDD using a PtP SGi tunnel**

#### 7.X.1.3 NIDD in roaming situation

##### 7.X.1.3.1 Delivery using SCEF

In roaming scenario, the PDN connection for NIDD using SCEF is established between UE and SCEF via V-MME and IWK-SCEF in the visited network and SCEF in the home network. The user traffic is exchanged with DoNAS between UE and V-MME, over T6a interface between V-MME and IWK-SCEF, over T7a interface between IWK-SCEF and SCEF and finally over T8 interface between SCEF and SCS/AS. Figure 7.X-XC shows the architecture for delivery of NIDD using SCEF in roaming situation.



**Figure 7.X-XC: EPS Architecture for NIDD using SCEF in roaming situation**

##### 7.X.1.3.2 Delivery using a PtP SGi tunnel

In roaming scenario, the PDN connection for NIDD using PtP SGi tuunel is established between UE and PGW via V-MME and V-SMF in the visited network and PGW in the home network. The user traffic is exchanged with DoNAS between UE and V-MME, over S11 interface between V-MME and V-SGW, over S8 interface between V-SGW and home PGW and finally over a PtP SGi tunnel between PGW and SCS/AS (Figure 7.X-XD).



**Figure 7.X-XD: EPS Architecture for NIDD using a PtP SGi tunnel in roaming situation**

### 7.X.2 LI for NIDD

#### 7.X.2.1 LI for NIDD using SCEF

In non-roaming scenario, only SCEF will provide IRI-POI and CC-POI.

In roaming scenario, IWK-SCEF shall provide the IRI-POI and CC-POI functions for the visited network while SCEF in the home network provides IRI-POI and CC-POI.

NOTE: Only home-routed mode applies.

LI for NIDD using SCEF or IWK-SCEF is described in clause 7.X.2.2.

#### Packet header reporting and non-3GPP access are not applicable to NIDD.7.X.2.2 LI for NIDD using a PtP SGi tunnel

In non-roaming scenario, the PGW provides an IRI-POI and a CC-POI. Although SGW provides an IRI POI and a CC-POI for IP and Ethernet-based PDN connections, PGW terminates the PtP SGI tunnel with the SCS/AS and has the same capabilities as SCEF for NIDD.

In roaming scenario, V-SGW and H-PGW shall provide the IRI-POI and CC-POI functions as shown in Figure 6.3-2 which also concerns IRI-POI and CC-POI functions for IP and Ethernet-based PDN connections.

NOTE: Only home-routed mode applies for NIDD using a PtP SGi tunnel.

The LI architecture for NIDD using a PtP SGi tunnel is the same as presented in figure 6.3-2.

However, the user plane packets between UE and PGW flow through the MME and SGW as shown in figures 7.X-XB and 7.X-XD.

The same xIRIs as specified in clause 6.3.3.3 for PDN connections of IP or Ethernet type and the same xCC are also considered for PDN connections for NIDD using a PtP SGi tunnel, considering unstructured payload format.

## 7.Y LI at SCEF

### 7.Y.1 General

The present document specifies SCEF as POI for:

- NIDD.

- Device triggering.

- MSISDN-less MO SMS.

- Parameter provisioning.

### 7.Y.2 LI for NIDD using SCEF

#### 7.Y.2.1 Architecture

The SCEF in the home network and the IWK-SCEF in the visited network shall provide both IRI-POI and CC-POI functions. The figure 7.Y-1 gives a reference point representation of the LI architecture with SCEF as a CP NF and UP NF providing the IRI-POI and CC-POI functions for NIDD using SCEF. SCEF is the anchor point for PDN connection establishment and NIDD traffic.



**Figure 7.Y-1: LI architecture for NIDD using SCEF showing LI at SCEF/IWK-SCEF**

#### 7.Y.2.2 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 SCEF:

- IMSI.

- MSISDN.

- External Identifier.

The interception performed on the above three identities are mutually independent, even though, an xIRI may contain the information about the other identities when available.

#### 7.Y.2.3 IRI events

The IRI-POI in the SCEF/IWK-SCEF shall generate xIRI when it detects the following specific events or information in both roaming and non-roaming situations:

- PDN connection establishment.

- PDN connection update.

- PDN connection release.

- Start of interception with established PDN connection.

- Unsuccessful procedure.

The PDN connection establishment xIRI is generated when the IRI-POI present in the SCEF/IWK-SCEF detects that a PDN connection for NIDD using SCEF has been established for the target UE. The SCEF plays the role of anchor point for that PDN connection.

The PDN connection update xIRI is generated when the IRI-POI present in the SCEF/IWK-SCEF detects that a PDN connection for NIDD using SCEF is modified for the target UE.

The PDN connection release xIRI is generated when the IRI-POI present in the SCEF/IWK-SCEF detects that a PDN connection for NIDD using SCEF is released for the target UE.

The start of interception with an established PDN connection xIRI is generated when the IRI-POI present in a SCEF/IWK-SCEF detects that interception is activated on the target UE that has an already established PDN connection for NIDD using SCEF in the EPS. When a target UE has multiple PDN connections, this xIRI shall be sent for each PDN connection with a different value of correlation information.

When additional warrants are activated on a target UE, MDF2 shall be able to generate and deliver the start of interception with an established PDN connection related IRI messages to the LEMF associated with the warrants without receiving the corresponding start of interception with an established PDN connection xIRI.

The unsuccessful procedure xIRI is generated when the IRI-POI present in the SCEF/IWK-SCEF detects an unsuccessful procedure for PDN connection establishment, update, release or data delivery, data reception.

SCEF/IWK-SCEF generates xCC for NIDD using SCEF if CC is requested.

### 7.Y.3 LI for device triggering

#### 7.Y.3.1 Background

Device triggering is the means by which an SCS/AS sends information to the UE via the SCEF to trigger the UE to perform application specific actions that include initiating communication with the SCS/AS (see TS 23.682 [XY] clause 5.2 and TS 29.122 [XX] clause 4.4.6).

The device trigger request is authorized by SCEF by submitting the MSISDN or External Identifier of the UE to the HSS. After successful authorization, SCEF forwards the Device trigger request with the IMSI of the UE to the corresponding SMS-SC to be delivered to that UE. The EPS architecture for NIDD is presented in figure 7.Y-2.

The device trigger may be recalled or replaced by the SCS/AS if the UE is not reachable at the time the SCS/AS has delivered the device trigger to the UE.



#### **Figure 7.Y-2: EPS architecture for device triggering**

#### 7.Y.3.2 Architecture

The figure 7.Y-1 without the CC-POI in SCEF provides the architecture for LI for device triggering.

#### 7.Y.3.3 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 SCEF:

- IMSI.

- MSISDN.

- External Identifier.

The interception performed on the above three identities are mutually independent, even though, an xIRI may contain the information about the other identities when available.

#### 7.Y.3.4 IRI events

The IRI-POI present in the SCEF shall generate xIRI, when it detects the following specific events or information related to the device triggering service:

- Device trigger.

- Device trigger replacement.

- Device trigger cancellation.

- Device trigger report notification.

The device trigger xIRI is generated when the IRI-POI present in the SCEF detects that a device trigger has been received from an SCS/AS and is delivered to the SMS-SC for the target UE.

The device trigger replacement xIRI is generated when the IRI-POI present in the SCEF detects that a device trigger replacement has been received from an SCS/AS and delivered to the SMS-SC to replace previously submitted device trigger message which is not yet delivered to the target UE.

The device trigger cancellation xIRI is generated when the IRI-POI in the SCEF detects that a device trigger cancellation has been received from an SCS/AS and delivered to the SMS-SC to recall previously submitted device trigger which is not yet delivered to the target UE.

The device trigger report notification xIRI is generated when the IRI-POI present in the SCEF detects that a device trigger report is returned to the SCS/AS with a cause value indicating the trigger delivery outcome (e.g., succeeded, unknown or failed and the reason for the failure).

### 7.Y.4 LI for MSISDN-less MO SMS

#### 7.Y.4.1 Background

An MSISDN-less MO SMS is sent by a UE without MSISDN as originator and received by a third party application as destination (i.e., SCS/AS) via SMS-SC and SCEF. MSISDN-less means that the UE has a subscription without MSISDN but an External Identifier which form is username@realm. MSISDN-less MO-SMS service allows MSISDN-less UE to send small data to an SCS/AS using SMS-MO. The SMS-MO received by the SMS-SC through MO submission procedure as defined in TS 23.040 [18], is directly forwarded to the SCEF for further transfer to the recipient SCS/AS (see TS 23.682 [XY] clause 5.15).

The SCEF queries the HSS with the IMSI of the UE, obtains the corresponding External Identifier of the UE sending the SMS, and forwards the SMS to the SCS/AS including the External Identifier of the originating UE.



#### **Figure 7.Y-3: EPS architecture for MSISDN-less MO SMS**

#### 7.Y.4.2 Architecture

The figure 7.Y-1 without the CC-POI in SCEF provides the architecture for LI for MSISN-less MO SMS.

#### 7.Y.4.3 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 SCEF:

- IMSI.

- External Identifier

The interception performed on the above two identities are mutually independent, even though, an xIRI may contain the information about the other identities when available.

#### 7.Y.4.4 IRI events

The IRI-POI present in the SCEF shall generate xIRI, when it detects the following specific events or information related to the MSISDN-less MO SMS:

- MSISDN-less MO SMS.

The MSISDN-less MO SMS xIRI is generated when the IRI-POI present in the SCEF detects that a MSISDN-less MO SMS has been received from a target UE by the SCEF and is delivered to the recipient SCS/AS.

### 7.Y.5 LI for parameter provisioning

#### 7.Y.5.1 Background

Parameter provisioning is a capability exposed by SCEF to SCS/AS (see TS 23.682 [XY] clause 5.10). The SCS/AS can use this capability to tell the network when a device is expected to communicate. The core network can then use this information to create assistance information for the RAN. The RAN may then use the assistance information to minimize UE state transitions. The SCS/AS provides the communication pattern parameters to SCEF, and SCEF updates the UE subscription data via HSS. The parameters shall have a validity time. The validity time indicates when the communication pattern parameters expire. The validity time may be set to indicate that the communication pattern parameters have no expiration time.



**Figure 7.Y-4: EPS architecture for Parameter Provisioning**

#### 7.Y.5.2 Architecture

The figure 7.Y-1 without the CC-POI in SCEF provides the architecture for LI for parameter provisioning.

#### 7.Y.5.3 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 SCEF:

- MSISDN.

- External Identifier.

#### 7.Y.5.4 IRI events

The IRI-POI present in the SCEF shall generate xIRI, when it detects the following specific events or information related to Parameter provisioning:

- Communication pattern update.

The Communication pattern update xIRI is generated when the IRI-POI present in the SCEF detects that an SCS/AS sent a request to create, update, delete or get communication pattern data related to the targe UE and the SCEF updates or gets these data from the UE subscription profile via HSS.

End of all changes