**3GPP TSG-SA3 Meeting #94-LI *s3i240482***

**Amsterdam, Netherlands, 9th Jul 2024 - 12th Jul 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **33.127** | **CR** | **0243** | **rev** | **1** | **Current version:** | **18.8.0** |  |
|  |
| *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 IMS Data Channel Stage 2 |
|  |  |
| ***Source to WG:*** | SA3-LI (OTD\_US, Nokia) |
| ***Source to TSG:*** | SA3 |
|  |  |
| ***Work item code:*** | LI18 |  | ***Date:*** | 2024-07-09 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | Currently, there is no support for LI of IMS Data Channel in TS 33.127/33.128. This CR adds such support via various changes to the existing IMS LI clauses. |
|  |  |
| ***Summary of change:*** | Add IMS Data Channel capabilities throughout clause 7.4 to support IMS DC LI reporting. |
|  |  |
| ***Consequences if not approved:*** | Specification will remain incomplete. CSPs will not be able to meet LI obligations. |
|  |  |
| ***Clauses affected:*** | 3.3, 7.4.1, 7.4.2.1, 7.4.3.1, 7.4.3.2, 7.4.4.1, 7.4.6.2, 7.4.6.3 |
|  |  |
|  | **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:*** | s3i240442, s3i240470 |

\*\*\*\*\*\* START CHANGES \*\*\*\*\*\*\*\*\*

\*\*\*\*\*\* START OF FIRST 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

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 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

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

IM-MGW IM Media Gateway

IP Interception Product

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

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

VNF Virtual Network Function

VNFC Virtual Network Function Component

W-AFG Wireline Access Gateway Function

xCC LI\_X3 Content of Communication

xIRI LI\_X2 Intercept Related Information

\*\*\*\*\*\* END OF FIRST CHANGE \*\*\*\*\*\*\*\*\*

\*\*\*\*\*\* START OF SECOND CHANGE \*\*\*\*\*\*\*\*\*

## 7.4 IMS

### 7.4.1 General

Figure 7.4-1 depicts the EPS/5GS-Anchored IMS High Level LI Architecture.

Figure 7.4-1: EPS/5GS-Anchored IMS High Level LI Architecture

### 7.4.2 Architecture

#### 7.4.2.1 Overview

The capabilities defined in this clause apply to the interception of IMS-based services. The target of interception can be a subscriber of the CSP, an inbound roamer or a non-local ID.

The network function involved in providing the interception of IMS-based services are determined based on the deployment option, the network configuration, LI service scope and the IMS session including the roaming scenarios. The IRI-POI functions are provided by the network functions that handle the SIP messages (those network functions are

referred to as IMS Signalling Functions) and the triggered CC-POI functions are provided by the network functions that handle the media (these network functions are referred to as IMS Media Functions). The CC-TF functions are also provided by the network functions that handle the SIP messages (referred to as IMS Signalling Functions) and manage the IMS Media Functions. The network functions that provide the CC-TF functions can be different from the network functions that provide the IRI-POI functions.

NOTE: The concepts presented above also apply to IMS Data Channel sessions.

An architecture depicting the LI for IMS is depicted in figure 7.4-2 below.



Figure 7.4-2: IMS LI architecture

The LICF present in the ADMF receives the warrant from an LEA, derives the intercept information from the warrant and provides it to the LIPF. The LIPF present in the ADMF provisions IRI-POI, CC-TF, MDF2 and MDF3 over the LI\_X1 interfaces.

The CC-TF sends the CC intercept trigger to the CC-POI over LI\_T3 interface. The IRI-POI generates the xIRI and delivers the same to the MDF2 over LI\_X2 interface. The CC-POI generates the xCC and delivers the same to the MDF3 over LI\_X3 interface.

The MDF2 generates IRI messages from the received xIRI and delivers those IRI messages to the LEMF over LI\_HI2 interface. The MDF3 generates the CC from the received xCC and delivers that CC to the LEMF over LI\_HI3 interface.

The network configuration and IMS service scenarios including the roaming scenarios determine the network functions that provide the IRI-POI, CC-TF and CC-POI functions. The network function that provides the IRI-POI or CC-TF is referred to as IMS Signalling Function in figure 7.4-2 and the network function that provides the CC-POI functions is referred to as IMS Media Function in figure 7.4-1.

NOTE: The details of correlation between the xIRI and the xCC when IRI-POI and CC-TF are not co-located is not defined in the present document. The IRI-POI and CC-TF are logical functions and they may be handled by the same process when they are co-located in the same IMS Signalling Function.

\*\*\*\*\*\*\*\*\*\*\*\*\* END OF SECOND CHANGE \*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\* START OF THIRD CHANGE \*\*\*\*\*\*\*\*\*

### 7.4.3 IRI-POI

#### 7.4.3.1 General

The IRI-POI detects the SIP messages that are related to a target subscriber and then generates and delivers the related xIRI to the MDF2 over LI\_X2.

The following IMS Network Functions (i.e. IMS Signalling Functions) that handle SIP signalling for IMS sessions may provide the IRI-POI functions:

- S-CSCF.

- E-CSCF.

- P-CSCF.

- IBCF.

- MGCF.

- Conference AS/MRFC.

- Telephony AS.

- PTC server.

- DCSF.

Clause 7.4.6 gives more information from network topology/session perspective how different IMS Network Functions are to be used in providing the IRI-POI functions. The Telephony AS is one of the IMS Network Functions that provides the IRI-POI for STIR/SHAKEN and RCD/eCNAM (see clause 7.14.2).

#### 7.4.3.2 IRI events

The IRI-POI present in the IMS Signalling Function generates the following xIRI:

- Encapsulated SIP message.

- CC unavailable in serving PLMN.

- Start of interception with an established IMS session.

- Data channel setup message.- Data channel termination message.

The encapsulated SIP message xIRI is generated and delivered to the MDF2 when the IRI-POI in the IMS Signalling Function detects that a SIP message is received from, or sent to, a target or processed on behalf of a target at the IMS Signalling Function.

The CC unavailable in PLMN xIRI is generated and delivered to the MDF2 for the session scenarios where access to the target media is not available to the CSP (see clause 7.4.7.1).

The start of interception with an established IMS session xIRI is generated when an interception is activated on an established IMS session. To support the possibility of generating such an xIRI, the IMS Signalling Function shall store and maintain the session related information including the media information for the life of all IMS sessions.

The data channel setup message xIRI is generated and delivered to the MDF2 when the IRI-POI in the DCSF detects that the DCSF has received a DC call event from the IMS AS in the form of a DC control request and has responded with a media instruction set (see TS 23.228 [13], clause AC.7.1).

NOTE 1: Data channel setup invokes procedures within the HSS. The reporting of these events is defined in clause 7.2.3 of the present document.

The data channel termination message xIRI is generated and delivered to the MDF2 when the IRI-POI in the DCSF detects that either UE has triggered a SDP renegotiation to release the application data channel or the application has been closed (see TS 23.228 [13] clause AC.7.6).

NOTE 2: IMS DC across international NNI is not considered in this release.

NOTE 3: Roaming cases for IMS data channel are not considered in the present document.

\*\*\*\*\*\*\*\*\*\*\*\*\* END OF THIRD CHANGE \*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\* START OF FOURTH CHANGE \*\*\*\*\*\*\*\*\*

### 7.4.4 CC-TF and CC-POI

#### 7.4.4.1 General

The CC-TF detects the SIP messages that are related a target and then generates and sends a trigger to the CC-POI over the LI\_T3 reference point.

The CC-POI based on the trigger detects the media to be intercepted, generates the xCC and delivers the same to the MDF3.

The following IMS Network Functions (i.e. IMS Media Functions and IMS Signalling Functions) may provide the CC-POI and CC-TF functions:

- IMS-AGW with CC-TF in P-CSCF.

- TrGW with CC-TF in IBCF.

- IM-MGW with CC-TF in MGCF.

- MRFP with CC-TF in AS/MRFC (see NOTE 3).

- MRFP with CC-TF in Conference AS/MRFC (see NOTE 2).

- PTC Server with CC-TF in PTC Server (see NOTE 1).

- MF with CC-TF in IMS-AS.

- DC-AS with CC-TF in DCSF.

Clause 7.4.6 gives more information from network topology/session perspective how different IMS Network Functions are to be used in providing the CC-TF/CC-POI functions.

NOTE 1: The PTC Server provides the IRI-POI and CC-POI functions, accordingly, PTC Server itself is the CC-TF.

NOTE 2: Conference AS, MRFC and MRFP together are referred to as Conference Server. Conference AS/MRFC provide the conference focus functions as defined in TS 24.147 [28].

NOTE 3: When music tone or announcement is given to the calling user prior to answer on an incoming call to the target.

\*\*\*\*\*\*\*\*\*\*\*\*\* END OF FOURTH CHANGE \*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\* START OF FIFTH CHANGE \*\*\*\*\*\*\*\*\*

#### 7.4.6.2 IMS Network Functions providing the IRI-POI

The IMS Network Functions that handle the target side of the session provide the IRI-POI functions except when the alternate option is used for the non-local ID target. When the alternate option is used for the non-local ID target, the IMS network function that handles the session-leg of the local served user connected directly to the non-local ID target.

Table 7.4.6.2-1 below identifies the IMS Network Functions in providing the IRI-POI functions in a non-roaming case for various session scenarios.

Table 7.4.6.2-1: IMS Network Functions providing the IRI-POI functions (non-roaming case)

|  |  |  |
| --- | --- | --- |
| Session type/target type | Default | Alternative option |
| Normal sessions | S-CSCF | P-CSCF  |
| SMS over IMS | S-CSCF | P-CSCF |
| Emergency sessions | E-CSCF | P-CSCF (NOTE 1) |
| SMS over IMS to emergency services  | E-CSCF | P-CSCF (NOTE1) |
| Redirected sessions: intra-PLMN | S-CSCF | P-CSCF |
| Redirected sessions: inter-PLMN (CS domain) | S-CSCF | MGCF |
| Redirected sessions: inter-PLMN (IMS domain) | S-CSCF | IBCF |
| Conference (NOTE 2) | Conf-AS/MRFC | - |
| PTC | PTC-Server | - |
| Non-local ID in CS domain (NOTE 3, NOTE 3A) | MGCF | S-CSCF |
| Non-local ID in IMS domain (NOTE 3, NOTE 3A) | IBCF | S-CSCF |
| Non-local ID for SMS over IMS (NOTE 3) | S-CSCF | P-CSCF (NOTE 3A) |
| Data Channel Sessions | DCSF | - |

NOTE 1: For originated emergency sessions (or SMS over IMS to emergency services centre) handled in the fixed networks, where S-CSCF is also part of an emergency session, the S-CSCF based IRI-POI as a deployment option may also be considered.

NOTE 2: A conference ID can also be a target. Conf-AS stands for conference AS (see NOTE 2 in clause 7.4.4.1). When a normal session is extended to a conference session, the IMS signalling functions that provide the IRI-POI functions prior to the conference may continue to provide the IRI-POI functions in addition to the conference AS/MRFC.

NOTE 3: Non-roaming means that the local served user is non-roaming.

NOTE 3A: The default/alternate option used when the target is non-local ID is mutually independent of default/alternate option used when the target is local served user.

Table 7.4.6.2-2 below identifies the IMS Network Functions in providing the IRI-POI functions in a roaming case for various session scenarios.

Table 7.4.6.2-2: IMS Network Functions providing the IRI-POI functions (roaming case)

|  |  |  |
| --- | --- | --- |
| Session type/target type | Local Breakout (LBO) | Home Routed (HR) |
| HPLMN | VPLMN | HPLMN | VPLMN |
| Default | Alternate Option | Default | AlternateOption | Default | Alternate Option | Default | Alternate Option |
| Normal sessions | S-CSCF | IBCF | P-CSCF | - | S-CSCF | P-CSCF | N9HR/S8HR | - |
| SMS over IMS | S-CSCF | IBCF | P-CSCF | - | S-CSCF | P-CSCF | N9HR/S8HR | - |
| Emergency sessions/SMS over IMS | - | - | E-CSCF | P-CSCF | - | - | E-CSCF | P-CSCF |
| SMS over IMS to emergency services | - | - | E-CSCF | P-CSCF | - | - | E-CSCF | P-CSCF |
| Redirected sessions | S-CSCF | See table 7.4.6.2-3 | - | - | S-CSCF | See table 7.4.6.2-3 | - | - |
| Conference (NOTE 2) | Conf-AS/MRFC | - | - | - | Conf-AS/MRFC | - | - | - |
| PTC | PTC-Server | - | - | - | PTC-Server | - | - | - |
| Non-local ID (E.164) in CS domain (NOTE 3A, NOTE 4, NOTE 4A) | MGCF | S-CSCF | P-CSCF | IBCF (NOTE 4B) | MGCF | S-CSCF (NOTE 3A) | N9HR/S8HR | - |
| Non-local ID in SIP/IMS domain (NOTE 3A, NOTE 4, NOTE 4A) | IBCF | S-CSCF | P-CSCF | IBCF (NOTE 4B) | IBCF | S-CSCF (NOTE 3A) | N9HR/S8HR | - |
| Non-local ID for SMS over IMS (NOTE 4) | S-CSCF | IBCF | P-CSCF | - | S-CSCF | P-CSCF | N9HR/S8HR | - |
| Data Channel Sessions | DCSF | - | n/a | n/a | DCSF | - | n/a | n/a |

NOTE 4: For roaming, this means the local served user is roaming. Also, see NOTE 3.

NOTE 4A: The default/alternate options used in the HPLMN and default/alternate options used in the VPLMN are mutually independent.

NOTE 4B: This alternate option may be used only in the VPLMN for IMS sessions with home-routed media.

The interception capabilities for normal sessions as defined in tables 7.4.6.2-1 (non-roaming) and 7.4.6.2-2 (roaming) shall be used for the cases where the Conf-AS and the PTSC-Server are not under the control of CSP serving the warrant.

Table 7.4.6.2-3: Extension of table 7.4.6.2-2

|  |  |  |
| --- | --- | --- |
| Session type/target type | Local Breakout (LBO) | Home Routed (HR) |
| Redirected sessions: Intra-PLMN | Redirected-to party non-roaming | P-CSCF | P-CSCF |
| Redirected-to party is roaming | IBCF | P-CSCF |
| Redirected sessions Inter-PLMN | Redirected-to party in CS domain | MGCF | MGCF |
| Redirected-to party in IMS domain | IBCF | IBCF |

Table 7.4.6.2-3 shows the IMS Network Functions that provide the IRI-POI functions in the HPLMN for redirected sessions in a roaming case when the alternate option is used to provide the IRI-POI functions for the normal case.

NOTE 5: For the redirected do not answer related sessions, the IMS Network Functions that provide the IRI-POI functions prior to the redirection are as illustrated in table 7.4.6.2-2 (normal case) and after the redirection are as illustrated in table 7.4.6.2-3.

The IMS Network Functions that provide the IRI-POI for STIR/SHAKEN and RCD/eCNAM are listed in clause 7.14.2.

#### 7.4.6.3 IMS Network Functions providing the CC-TF and CC-POI functions

The IMS Network Functions that handle the target side (including the non-local ID target) of the session provide the CC-TF and CC-POI functions. For redirected scenarios, the IMS Network Functions that handle the redirected-to-user side of the session provide the CC-TF and CC-POI functions.

Table 7.4.6.3-1 provides the IMS Network Functions that provide the CC-TF functions when the CC-POI functions are provided by the IMS Media Functions as indicated (also see clause 7.4.4.1).

Table 7.4.6.3-1: Mapping between the IMS Network Functions providing the CC-TF and the CC-POI functions

|  |  |
| --- | --- |
| CC-POI  | CC-TF  |
| PGW (NOTE 1) | P-CSCF  |
| PGW-U (NOTE 1) | P-CSCF  |
| IMS-AGW | P-CSCF |
| MRFP | AS/MRFC |
| MRFP | Conference AS/MRFC  |
| PTC-Server | PTC-Server |
| TrGW | IBCF |
| IM-MGW | MGCF |
| MF | IMS-AS |
| DC-AS | DCSF |

NOTE 1: This is defined in TS 33.107 [11] and outside the scope of the present document.

Table 7.4.6.3-2 below identifies the IMS Media Functions that provide the CC-POI functions in a non-roaming case for session scenarios (PGW and PGW-U based options are not shown in the table).

Table 7.4.6.3-2: IMS Media Functions providing the CC-POI functions (non-roaming case)

|  |  |
| --- | --- |
| Session type/target type | CC-POI  |
| Normal sessions | IMS-AGW |
| Emergency sessions | IMS-AGW |
| Redirected sessions: intra-PLMN  | IMS-AGW |
| Redirected sessions: inter-PLMN (CS domain) | IM-MGW |
| Redirected sessions: inter-PLMN (IMS-domain) | TrGW |
| Music, announcement | MRFP |
| Conference (NOTE 4) | MRFP |
| PTC | PTC- Server |
| Non-local ID in CS domain (NOTE 2) | IM-MGW |
| Non-local ID in IMS domain (NOTE 2) | TrGW |
| Data Channel | MF |
| Data Channel (MF as UDP proxy) | DC-AS |

NOTE 2: Non-roaming means that the local served user is non-roaming.

Table 7.4.6.3-3 below identifies the IMS Media Functions that provide the CC-POI functions in a roaming case for various session scenarios (PGW and PGW-U based options are not shown in the table).

Table 7.4.6.3-3: IMS Media Functions providing the CC-POI functions (roaming case)

|  |  |  |
| --- | --- | --- |
| Session type/target type | Local Breakout (LBO) | Home Routed (HR) |
| HPLMN | VPLMN | HPLMN | VPLMN |
| Default | Alternate Option |
| Normal sessions | TrGW | IMS-AGW | - | IMS-AGW | N9HR/ S8HR |
| Emergency sessions | - | IMS-AGW | - | - | IMS-AGW |
| Redirected sessions: intra-PLMN  | Redirected-to-party non-roaming | IMS-AGW | - | - | IMS-AGW | - |
| Redirected-to-party roaming | TrGW | - | - | IMS-AGW | - |
| Redirected sessions: inter-PLMN | Redirected-to-party in CS domain | IM-MGW | - | - | IM-MGW | - |
| Redirected-to-party in IMS domain | TrGW | - | - | TrGW | - |
| Conference (NOTE 4) | MRFP | - | - | MRFP | - |
| Music, announcement | MRFP | - | - | MRFP | - |
| PTC | PTC-Server | - | - | PTC-Server | - |
| Non-local ID in CS domain (NOTE 3) | IM-MGW | IMS-AGW | TrGW (NOTE 5) | IM-MGW | N9HR/ S8HR |
| Non-local ID in IMS domain (NOTE 3) | TrGW | IMS-AGW | TrGW (NOTE 5) | TrGW | N9HR/S8HR |

NOTE 3: Roaming means that the local served user is roaming.

NOTE 4: When a normal session is extended to a conference session, the IMS-AGW that provides the CC-POI functions prior to the conference may continue to provide the CC-POI functions as an alternate (applicable only when the delivery of CC for a held conference call is not required), or in addition, to the MRFP. In that case, the P-CSCF provides the CC-TF functions for the CC-POI in the IMS-AGW.

NOTE 5: This is applicable only for IMS sessions with home-routed media with a TrGW present in the VPLMN.

\*\*\*\*\*\*\*\*\*\*\*\*\* END OF FIFTH CHANGE \*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\* END OF ALL CHANGES \*\*\*\*\*\*\*\*\*