

3GPP TSG SA WG3LI

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Title: Lawful Intercept Investigation of Mc Interfaces for 3GPP

Document for: Discussion

Agenda Item: 12

Lawful Intercept Investigation of Mc Interfaces for 3GPP

A. Introduction

The intent of this contribution is to focus on the Mc interfaces and associated requirements for Lawful Intercept (LI) in Release 4 and Release 5 of 3GPP. A simplified 3GPP reference architecture in Figure 1 in this contribution has been developed from **Figure 5-2 of TR 23.922 Architecture for an All IP Network and Figure 1 of TS 23.205 Bearer Independent CS Core Network, Stage 2 (Release 4)** to focus on the Mc interfaces in question. Network elements not involved in the issue have been removed and the RANs (e.g., ERAN/BSS/GERAN and UTRAN) are simplified in the figure to a single block.

Two scenarios are identified:

Scenario 1: RANs-SGSN

Scenario 2: RANs-MSC Server-MGWa

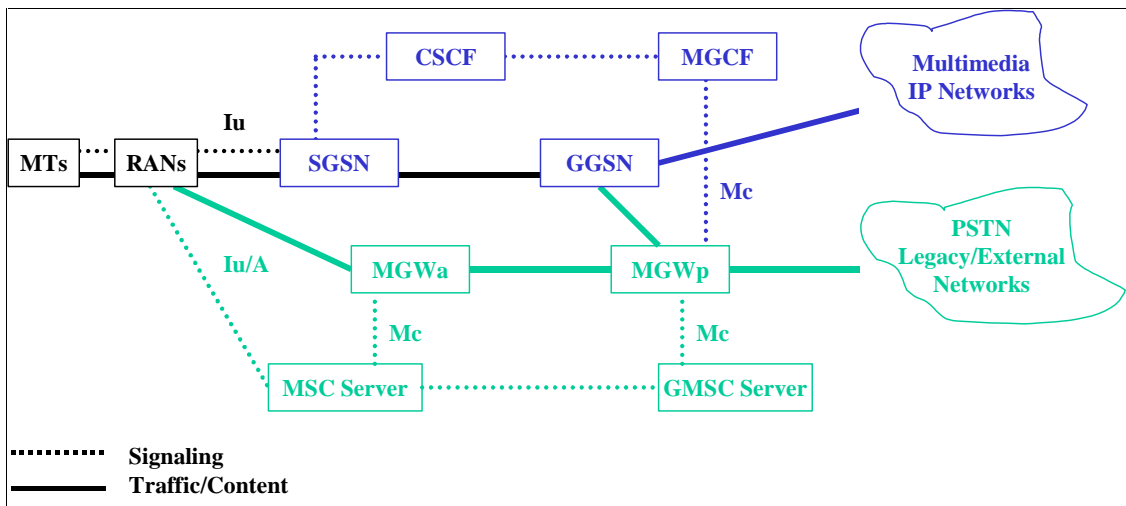


Figure 1 – Simplified 3GPP Reference Architecture (Mc Interfaces)

Note: Figure 1 is not suggesting any linkage between release 4 and release 5 architectures and is presented only as a basis for establishing the scenarios.

B. Discussion

Scenario 1: RANs-SGSN

Scenario 1 is characterized by MT-RAN access via the Iu-PS interface to Multimedia IP Networks and/or PSTN Legacy/External Networks for voice and data. Two cases are identified:

Case 1: MT-RAN Access to PSTN Legacy/External Networks

Case 2: MT-RAN Access to Multimedia IP Networks

Figure 2 shows possible LI Intercept Access Points (IAPs) for both cases.

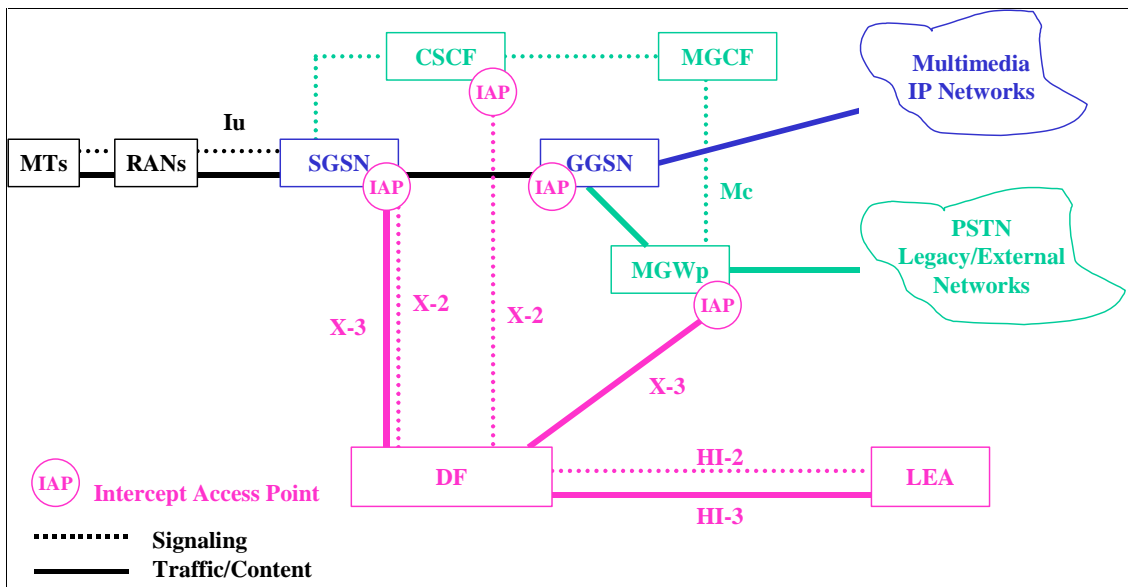


Figure 2 – Scenario 1: RANs-SGSN

Case 1: MT-RAN Access to PSTN Legacy/External Networks

Case 1 is characterized by SIP signaling between MT-CSCF in support of Voice over Packet (VoP) on the access network with media conversion to TDM at the PSTN Media Gateway (MGWp). The following LI Intercept Access Points (IAPs) are identified:

- 1) **CSCF-IAP:** Intercept point for SIP signaling controlling the VoP call. Reports IRI information to the Delivery Function (DF) via an X-2 interface.
 - a) SIP IRI: The current proposal is to encapsulate and send the SIP messages to the DF.
- 2) **MGWp-IAP:** Intercept point for traffic. Sends traffic to DF via X-3 interface.
 - a) Traffic: Interception on the circuit side.
 - i) Issues with interception on the circuit side:
 - issues with vocoders at the DF are eliminated;
 - bridging requirement at the MGWp;
 - requires correlation technique for X-2 from CSCF and X-3 circuit from MGWp;
 - issues with correlation information on Mc interface between MGCF and MGWp.
 - b) Traffic: Interception on the packet side. (not addressed)

Case 2: MT-RAN access to Multimedia IP Networks

For GPRS case 2 is characterized by PDP Context Activations and Deactivations and the establishment of access session resources to carry IP real-time and non-real-time traffic between the MT-RAN and Multimedia IP Networks. The following LI IAPs can be identified:

- 3) **SGSN_IAP:** Intercepts GPRS signaling controlling the activation and deactivation of sessions. Reports IRI via an X-2 interface. Intercepts packet mode traffic. Sends traffic to DF via an X-3 interface.
 - a) IRI: Addressed in GPRS/3GPP specifications.
 - b) Traffic: Addressed in GPRS/3GPP specifications.
- 4) **GGSN_IAP:** National option. Same as SGSN for traffic. IRI not the same as SGSN-IAP IRI.
 - a) IRI: Addressed in GPRS/3GPP specifications.
 - b) Traffic: Addressed in GPRS/3GPP specifications.

Issues:

1. Are there any new IP data requirements in release 4 or 5, which cannot be handled by the GPRS solutions available?

Scenario 2: RANs-MSC Server-MGWa

Scenario 2 is characterized by MT-RAN access via the Iu-CS or A interfaces to PSTN Legacy/External Networks for voice or data. One case is identified:

Case 3: MT-RAN access to PSTN Legacy/External Networks

Figure 3 shows the possible LI Intercept Access Points.

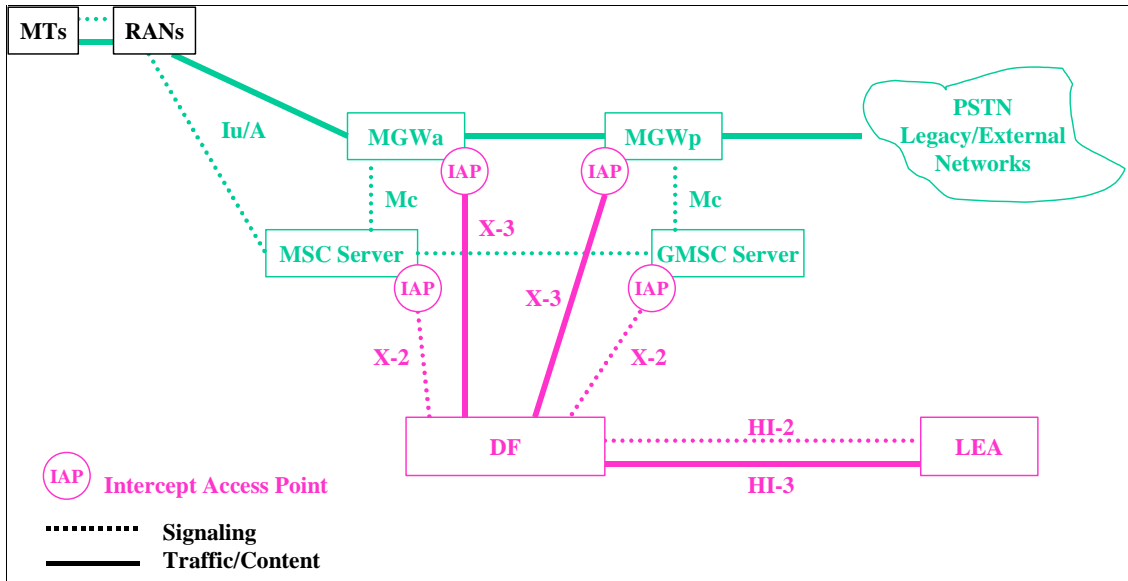


Figure 3 – Scenario 2: RANs-MSC Server-MGWa

Case 3: MT-RAN access to PSTN Legacy/External Networks

Case 3 is characterized by Iu-CS and A interface DTAP Call Control (CC) signaling supporting circuit mode voice or data calls. The following LI IAPs are identified:

- 5) **MSC Server-IAP:** Intercept point for A and Iu-CS call control signaling (CC), mobility signaling (MM), SMS, and supplementary services signaling (SS).
 - a) A interface IRI captured and reported via X-2 interface.
 - b) Iu-CS IRI captured and reported via X-2.
 - d) SMS captured and reported via X-2 interface.
 - e) SS IRI captured and reported via X-2 interface.

Issues:

- 1) correlation of X-2 and X-3 and Mc interface.
- 2) assumes use of existing IRI reporting methods for circuit mode traffic

- 6) **MGWa-IAP:** Intercept point for access network traffic form A and Iu-CS interfaces.
- a) interception of circuit mode voice on A and deliver to the DF via an X-3 interface
 - b) interception of AAL2 or IP voice on Iu-CS and delivery to the DF via an X-3 interface

Issues:

- 1) requirements to intercept traffic at MGWa?
- 2) interception of A interface on circuit side and delivery via X-3?
- 3) interception of Iu-CS AAL2 or IP voice and delivery via X-3?
- 4) correlation of X-2 and X-3 for both interfaces and requirements on Mc?
- 5) handover issues?
- 6) mobile-to-mobile calls?

- 7) **GMSC Server-IAP:** Intercept point for GSM Gateway MSC signaling.

- a) Gateway MSC IRI reported via X-2 interface.

Issues:

- 1) correlation of X-2 and X-3 and Mc interface?
- 2) assume use of existing IRI reporting methods for circuit mode traffic?

- 8) **MGWp-IAP:** Traffic Intercept point for Gateway MSC traffic.

- a) Traffic: intercepted and bridged to DF via X-3.

Issues:

- 1) correlation of X-2 and X-3 and Mc interface?
- 2) assume use of existing intercept methods for circuit mode traffic?

C. Recommendations

- 1) Analyze each case for LI requirements and methodologies.
- 2) Document the scenarios and LI methodologies for each case as appropriate.
- 3) Identify and document the LI requirements and methodologies for release 4 and release 5 separately.