

Lawful Interception Equipment for MNOs and Full MVNOs

In most countries, providing the Lawful Interception functions is a legal obligations for MNOs and full MVNOs. The Halys LI function allows to comply with all the requirements: Mobility Management, Voice, SMS, MMS, IP flows. The standard Halys equipments without any add-on have the X2 interfaces to centralize all the tickets in a common data base with the filters to search for particular identity, IMSI or MSISDN, as well as X1 and X3. The interfaces HI1, HI2, HI3 are not provided for an economical Lawful Intercept purely local Implementation.

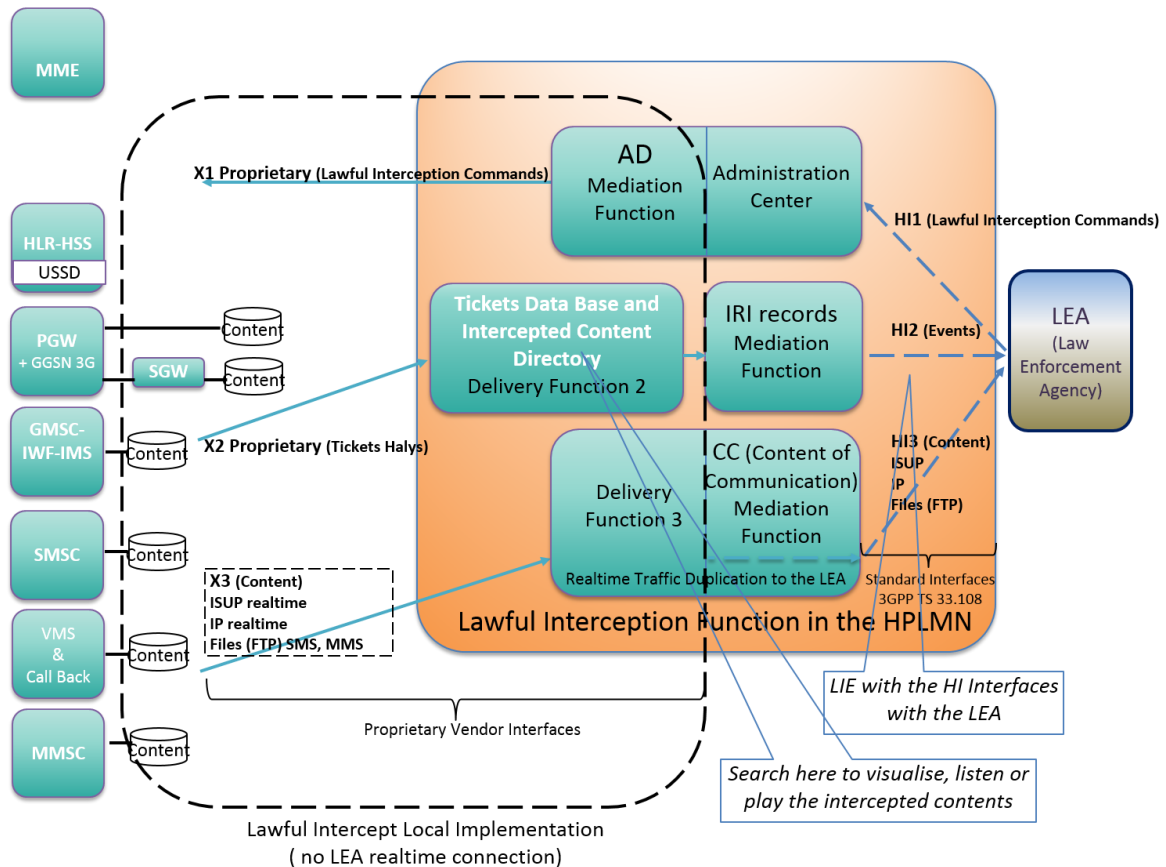


Fig1 – Legal Interception equipment (LIE) in a MNO or Full MVNO HPLMN:

All the network nodes on the left are “interception points” with their on local content storage, for example voice calls in the GMS-IWF-IMS, IP data in the SGW (data of visitors and subscribers) and PGW (full MVNO case), SMS in the SMSC, MMS in the MMSC, etc. To be transferred by X3 then by HI3 after mediation to the LEA. They also create event tickets centralised with their X2 interface to the central data base then converted into standard IRI format to be provided by HI2 to the LEA. The HI1 interface from the LI1, or the local X1 interface from a browser selects the target number and the list of communication types which must be intercepted. If the network elements are all from Halys, the LIE has all the X1, X2, X3 interfaces provided. Development for Mediation SW with other vendors is then added in the project budget. The LI function is available for all subscribers, outbound roaming or not and all visitors (MNO case).

For HI2: centralisation of tickets

The Central Data Base (“bases de données de Tickets”) provides the Distribution Function 2 (DF2) for all equipments Halys or not. A convenient “Trace Back” utility allows to visualise all the signalling concerning a target: SS7, S6a/Diameter, GTP, voice, SMS, MMS, IP (beginning and end of sessions). For intercepted communications, using a browser with a simple click on the ticket, allows to listen to

the recorded call or display the MSC or Multimedia content. All events are time tagged, beginning-end of data sessions (with the URL), of calls, mobility signalling (visited MSC/VLR, SGSN or MME), all supplementary-services (call barring, call forwarding, all messages).

RADIUS_DELIVER	ACCOUNTING	HSS_20160304_063959_383509	20160304_063959_383538	0.0.0.0	START	+33970675065	
RADIUS_SUBMIT	ACCOUNTING	HSS_20160304_063959_382968	20160304_063959_382984	192.168.2.114	START	+33970675065	
USSD_DELIVER	Notify	HSS_20160304_063821_821084	20160304_063821_821091		3	+33970675065	
RADIUS_SUBMIT	ACCOUNTING	HSS_20160304_063819_852691	20160304_063819_853712	127.0.0.1	STOP	+33970675065	
RADIUS_DELIVER	ACCOUNTING	HSS_20160304_063819_852970	20160304_063819_852994	0.0.0.0	STOP	+33970675065	
RADIUS_SUBMIT	ACCOUNTING	HSS_20160304_063819_852381	20160304_063819_852403	192.168.2.114	STOP	+33970675065	
MMS_SUBMIT	MM1_m-send-req	MSC_20160304_062434_838762613	20160304_062434_979032292		1.2	+33970675065	+33970675065
USSD_DELIVER	Notify	HSS_20160304_062250_089839	20160304_062250_089847		3	+33970675065	
RADIUS_SUBMIT	ACCOUNTING	HSS_20160304_062246_945726	20160304_062246_945762	127.0.0.1	START	+33970675065	
RADIUS_DELIVER	ACCOUNTING	HSS_20160304_062246_944891	20160304_062246_944916	0.0.0.0	START	+33970675065	
RADIUS_SUBMIT	ACCOUNTING	HSS_20160304_062246_944153	20160304_062246_944181	192.168.2.114	START	+33970675065	
USSD_DELIVER	Notify	HSS_20160304_061920_770379	20160304_061920_770386		3	+33970675065	
RADIUS_SUBMIT	ACCOUNTING	HSS_20160304_061917_699854	20160304_061917_699879	127.0.0.1	STOP	+33970675065	
RADIUS_DELIVER	ACCOUNTING	HSS_20160304_061917_699465	20160304_061917_699487	0.0.0.0	STOP	+33970675065	
RADIUS_SUBMIT	ACCOUNTING	HSS_20160304_061917_698826	20160304_061917_698850	192.168.2.114	STOP	+33970675065	
USSD_DELIVER	Notify	HSS_20160304_061909_209805	20160304_061909_209818		3	+33970675065	



Click here to display, listen, or play the content

Fig2– Example of centralization of tickets for a given interception target

Voice call interception, including in outbound roaming situations

The Halys LIE is able to intercept all calls by forcing target numbers to use Camel Ph2. This means that calls are then always routed to the GMSC, which is the interception point, by the SCF using a Camel CONNECT. The ISUP calls are both stored in the Content of Communication data base as well as duplicated on the HI3 interface. Instead of 2 separate legs Rx and Tx, Halys can provide a single conferenced flow which eases the analysis work of the LEAs.

SMS and MMS interception

The content is logged. In the case of MMS, the full MMS can be displayed locally with a browser, and voice or video content is played with the browser having the full list of codecs (AMR, video, etc...)

IP GPRS interception

To help classify the interceptions the DPI facility in the GGSN/PGW of the MNO or full MVNO is able to decode the DNS queries for the URL in the HTTP GET and POST, then the full TCP stream may be recorded or duplicated on the HI3 interface.

Local and LEA connected configurations of the LIE

The Lawful Interception without a LEA connection and the HI1, HI2, HI3 protocols may be sufficient. In that case the LIE is operated locally with a browser as described above.

Technical Data:

Linux OS on Intel Servers or Virtual Machines

Compliance for HI1, HI2, HI3

3GPP TS 33.108 v13.0.0

Implementation of Halys X2, X3 (content)

X2: Halys tickets

X3 content: ISUP and IP realtime

Licensing: 2 types: “local LIE” without HIs and “LEA connected” with mediation to Interfaces HI1, HI2, HI3 licenses. Additional storage price depends on the number of subscribers and the duration of the interception files keeping (one month to several years).