HLR – HSS 3G and 4G

for ordinary SIM cards, Multi IMSI SIM and multi MNO support

This Halys HLR-HSS is one of the most comprehensive on the market with all recent 3GPP standards, integrating all the MAP services defined for HLR and all S6a/Diameter for HSS 4G with a common AuC ("Milenage" algorithm) and a common Data Base of subscriber profiles. For 3G, it includes a full USSD server for customer usage alerts on costs and usage. It also integrates the Steering of Roaming, which makes it immune to anti-steering systems. Specially designed for public safety, it also includes the Halys patented automatic identity masking for VIP customers. The HLR-HSS is very flexible to support several MNOs simultaneously as all subscriber records are individual with their security keys Ki and the OP operator security key for the "milenage" and COMP-128 algorithms.

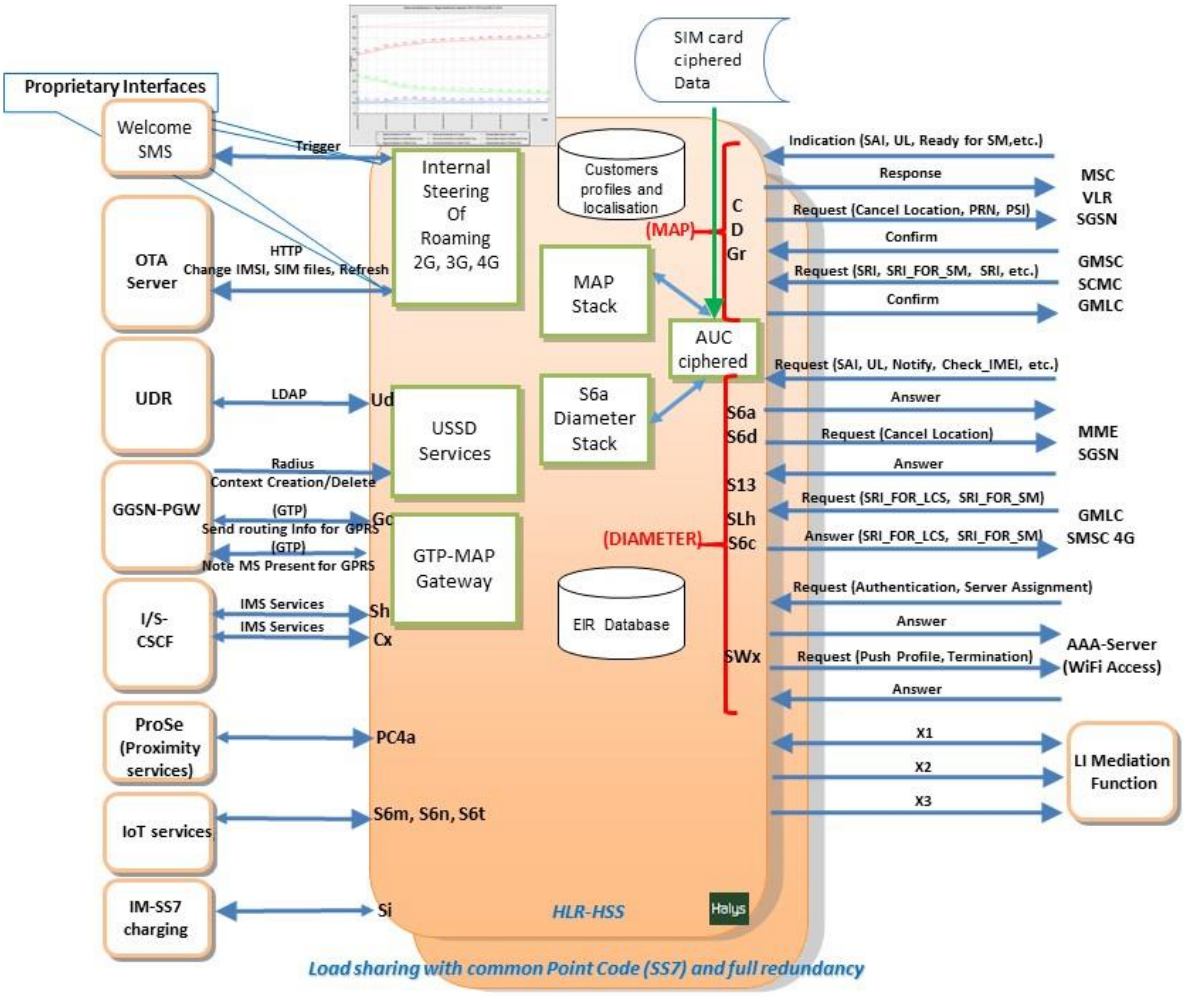

Figure 1 - Halys HLR-HSS with interfaces

1- Interfaces with OTA server and GGSN-PGW

- HTTP interface with an OTA server to modify the files in the SIM cards or to trigger a change of IMSI to optimize the cost in a roaming situation.
- the HLR-HSS is notified of the beginning and end of data session to alert customers with "USSD PUSH" with the cost/Mb and the total charge.
- The Gc interface accepts GTP directly from the GGSN or PGW as it is capable of converting to internal MAP. The HLR thus allows the implementation of "Network Initiated PDP contexts" for services when the customer is triggered to create automatically a data session.

2- FULL support of 3GPP standards 3G (all MAP services)

The HLR *supports fully* all the V3 MAP concerning a HLR:

AC Name	Operations
locationCancellationContext	cancelLocation
imsiRetrievalContext	sendIMSI
infoRetrievalContext	sendAuthenticationInfo
mwdMngtContext	readyForSM
msPurgingContext	purgeMS
shortMsgAlertContext	alertServiceCentre
resetContext	reset
networkUnstructuredSsContext	ProcessUnstructuredSS-Request (USSDPROCESS) unstructuredSS-Request unstructuredSS-Notify
networkFunctionalSsContext	SS (register) SS (erase) SS (activate) SS (deactivate) SS (registerPassword) SS (interrogate) SS (getPassword)
shortMsgGatewayContext	sendRoutingInfoForSM reportSM-DeliveryStatus InformServiceCentre
networkLocUpContext	UpdateLocation (UL) forwardCheckSs-Indication restoreData insertSubscriberData activateTraceMode deactivateTraceMode
gprsLocationUpdateContext	UpdateGprsLocation (UL GPRS) insertSubscriberData activateTraceMode deactivateTraceMode
SubscriberDataMngtContext (Stand Alone)	insertSubscriberData deleteSubscriberData
roamingNumberEnquiryContext	ProvideRoamingNumber (PRN)
locationInfoRetrievalContext	sendRoutingInfo
gprsNotifyContext	noteMsPresentForGprs
gprsLocationInfoRetrievalContext	sendRoutingInfoForGprs
failureReportContext	failureReport
subscriberInfoEnquiryContext	provideSubscriberInfo
anyTimeEnquiryContext	anyTimeInterrogation
anyTimeInfoHandlingContext	anyTimeSubscriptionInterrogation anyTimeModification
ss-InvocationNotificationContext	ss-Invocation-Notification

AC Name	Operations
reportingContext	setReportingState statusReport remoteUserFree
callCompletionContext	registerCC-Entry eraseCC-Entry
istAlertingContext	istAlert
ServiceTerminationcontext	istCommand
locationSvcGatewayContext	sendRoutingInfoForLCS
subscriberDataModificationNotificationContext	noteSubscriberDataModified
authenticationFailureReportContext	authenticationFailureReport

3- FULL support of 3GPP standards 4G (all S6a-S6d-S13- S6m, S6n, S6t Diameter services) including LCS, SMS and NB-IoT

Category	Operations
Location Management	Update Location (UL) Cancel Location Purge UE Insert Subscriber Data Delete Subscriber Data
Authentication	Authentication Information
Fault recovery	Reset Notify
Equipment Identity Register	Check_IMEI
IoT SIR, CIR, RIR	S6m, S6n, S6t
IMS MAR, UAR, LIR, SAR	Cx, Sh
LCS	SLh
SMS	S6c
WiFi	SWx

4- User data convergence, Interface with a UDR (SOAP and LDAP)

The HLR-HSS includes the Ud interface with a User Data Repository (UDR or SDP) .
For the implementation of emergency services it includes the PC4a interface with the ProSe Application Servers which could also use the Ud interface.

Compliance
3GPP TS 29.002 v12.7.0 (2015-01), « Digital Cellular Telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS);Mobile Application Part(MAP) specification », Rel 12,
3gpp TS 29.272 v11.5.0, "LTE, Evolved Packet System (EPS), Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter Protocol, Rel 12", (description of the S6, S13 and S7 interfaces)
3gpp TS 29.173 v12 (2014-10), « Digital Cellular Telecommunications system (Phase 2+); Universal Mobile Telecommunications System(UMTS); LTE; Location Services (LSC); Diameter based SLh interface for Control Plane LCS », Rel 12.
Technical Data:
Linux OS on Intel Servers or Virtual Machines
Licensing: Pay-as-you-grow capacity license based on the number of subscribers