

OTA Server for SIMs and for GPRS Profiles

OTA (Over-The-Air) is the technology used to communicate with SIM cards or terminals, download applications without being physically connected.

In **“Push mode” (method based on the SMS)** the Halys OTA server reduces the downloading time to improve the customer satisfaction and network usage. This is done *because a dedicated SMSC is included* which is compliant with MAP v3, which avoids a new "paging" between each SMS to the same destination (OTA payload are generally too big to be fit inside one SMS)..

In **“Pull mode”** (OTA over IP using IP and the BIP CAT-TP protocols) allows a faster operation for huge volume updates (downloads of SIM Toolkits) and SIM cards updates on SIM demand.

Example of OTA SIM applications:

- SIM toolkits installation/update including the update of multi-IMSI security domain's,
- address book backup/restoration,
- Setup of preferred visited VPLMN while roaming.

The OTA GPRS (Terminal Data Service Access) profiles concern the device management, not the SIM card, mainly the GPRS configuration of the various APNs. When the SIMs have an Automatic Device Detection applet (ADD), the download of the APNs is automatic when a new SIM is inserted in a handset which gives immediately the GPRS data service to the customer and shows the commercial interest of coupling the OTA for SIM and GPRS as Halys does..

1- All types of network technologies supported 2G-3G and 4G

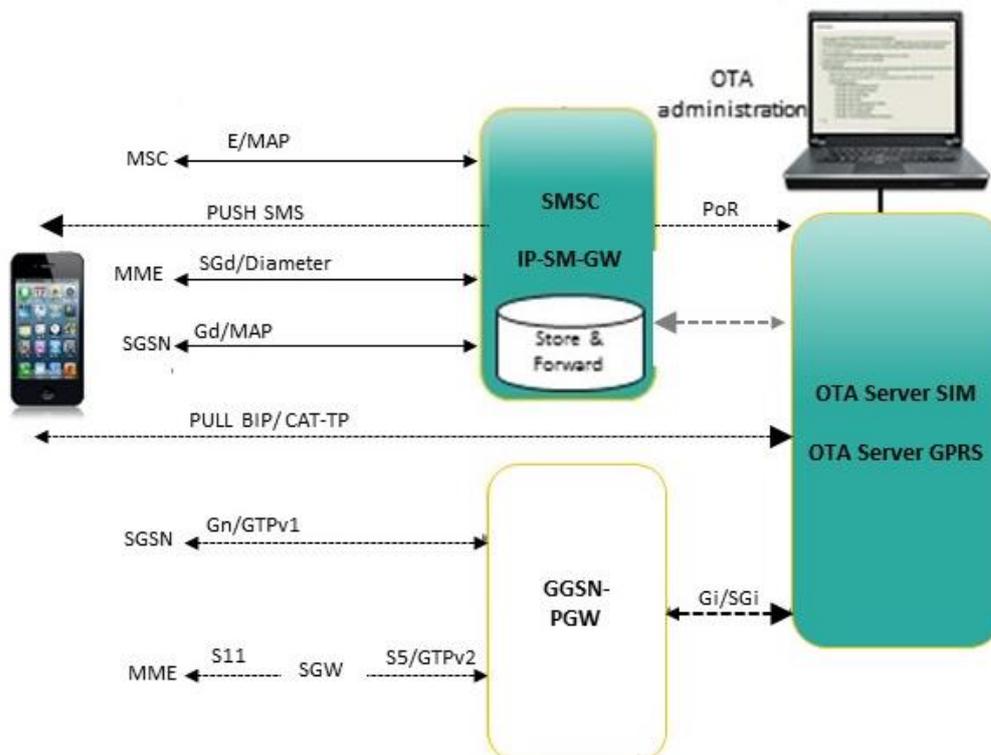
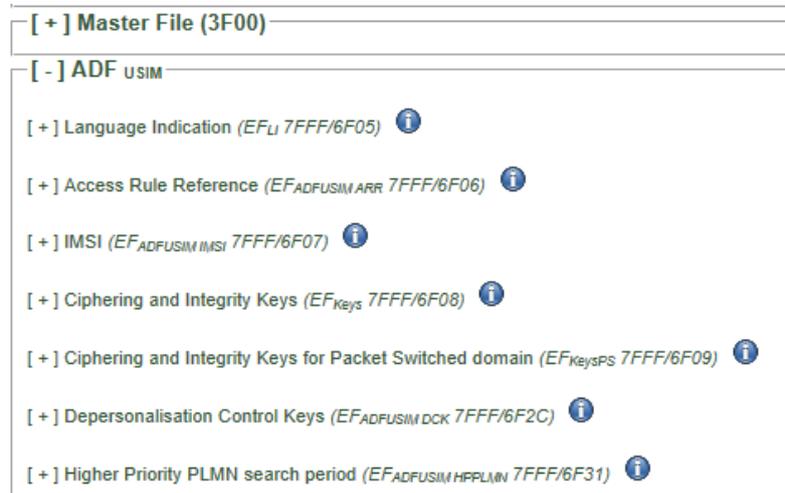


Figure 1: Architecture of the OTA system Push and Pull

Using the IP Pull mode, the terminal can use a 2G-3G of 4G data service. When using SMS the OTA system is able to send or receive (the Proof of Receipt by SMS-MO) from 2G-3G networks with MAP but also from 4G with SGd/Diameter. Few networks (2017) use SMS 4G, but this will be important in the future.

2- All types of standard SIM files can be read or updated with a PoR

All files defined in standard 3GPP TS 31.102 are supported by Halys OTA server provided they are defined editable during the electrical profile access. These files can be read or written using individual OTA commands or bulk campaigns.



3 - All network types SS7, Diameter or IP supported

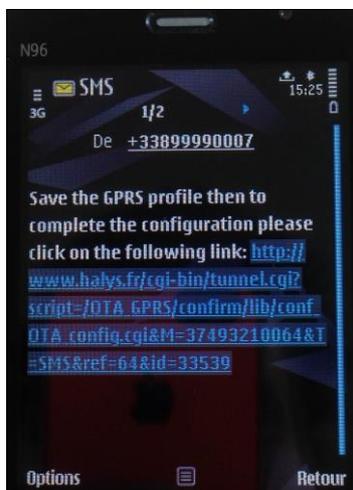
The integrated SMSC offers the SS7 SMS as well as the new 4G SMS with the SGd interface to / from (The PoR) a MME. The OTA server also includes the BIP/CAT-TP IP protocol.

4- Bulk Campaign Manager

Used for a general update of all SIMs, such as (rare) change of the MCC of a country code, merge of two networks (SPN), but also the frequent case of roaming preferences. It can be started at a specific time, and you have the history of all the campaigns, with their end-to-end success result for all SIMs based on the Proof of Receipt (PoR) sent by the SIMs.

5- Device Management without the need of an IMEI data base

It allows to manually download a device with the list of APNs. The Halys particularity (Patent) is to use a learning process to avoid to have to know from the IMEI the type of profile. It is also used by the ADD when a new SIM is inserted in a terminal. It provides also a PoR so the operator knows exactly the data service ability of a particular subscriber.



To get a Proof of Receipt, after downloading a GPRS profile, the OTA server sends an SMS containing an URL. The recipient clicks on it in order to connect to the OTA server which confirms the setting for that terminal

References

[Tapez ici]

[1] Gsma, «Remote Provisioning Architecture for Embedded UICC Technical Specification" version 3.2 27 june 2017).

[2] Characteristics of the Universal Subscriber Identity Module (USIM) application », Release 14, *the full list and characteristics of all directory and files in a SIM card*.

[3] "Système de mise à jour du profil GPRS d'un mobile », A.Henry-Labordère, W.Manaï, B.Mathian, patent Halys FR 12 57854.